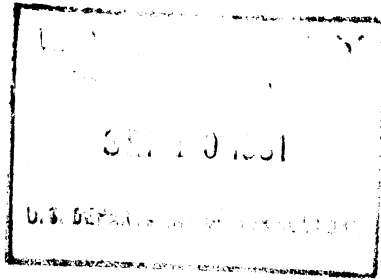


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Costs of Manufacturing Carded Cotton Yarn and Means of Improvement



A Research and Marketing Act Contract Report

UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

The research on which this report is based was made possible by funds provided by the Agricultural Research and Marketing Act of 1946. It was carried on under the general supervision of D. B. DeLoach, Associate Head, and B. S. White, Jr., Head, of the Division of Marketing and Transportation Research, and of O. C. Stine, Assistant Chief of the Bureau of Agricultural Economics.

Plans for this research were developed mainly by L. D. Howell of the Bureau of Agricultural Economics, and Ernest S. Shipley of the United States Tariff Commission, with the advice and assistance of representatives of the Carded Yarn Association, Inc., and the Ralph E. Loper Co. of Greenville, S. C. Detailed cost data for a representative sample of 15 carded cotton-yarn mills were assembled, analyzed, and interpreted, and detailed specifications and operating results for Model low-cost mills were prepared by the Ralph E. Loper Company under contract with the United States Department of Agriculture.

The results submitted by the contractor were prepared for publication and much of the text was written by L. D. Howell, with the advice and assistance of Walter Simister, Jr., president of the Ralph E. Loper Co. E. O. Fitzsimons, president, E. N. Brower, Chairman of the Board, and other representatives of the Carded Yarn Association, Inc., served in an advisory capacity in planning and in developing the study.



UNITED STATES
DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

Cost of Manufacturing Carded Cotton Yarn and Means of Improvement¹

A REPORT OF THE RALPH E. LOPER COMPANY, UNDER CONTRACT, AS AUTHORIZED BY THE RESEARCH AND MARKETING ACT. PREPARED FOR PUBLICATION IN THE BUREAU OF AGRICULTURAL ECONOMICS, BY L. D. HOWELL, AGRICULTURAL ECONOMIST.

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SUMMARY

Research designed to show the most feasible means of increasing the efficiency and of reducing the costs of manufacturing carded cotton yarns reveals the possibilities of making substantial reductions, particularly in labor costs. For most mills the reductions indicated would require much new and modern machinery, increased workloads, some modernization of buildings, and simplification of the variety and number of counts of yarn spun.

This research was planned and developed to supply information for the use of manufacturers of carded cotton yarns and indirectly to benefit the cotton industry as a whole, including farm producers

¹ Submitted for publication March 12, 1951.

and consumers of cotton products. Information relating to costs of manufacturing carded cotton yarns under actual operating conditions and detailed specifications and operating results for Model low-cost mills were developed for use in determining the adjustments needed.

Detailed specifications were prepared for so-called Model low-cost mills for manufacturing typical kinds of carded cotton yarns. They show the most desirable buildings, machinery and equipment, floor plans, labor requirements, draft programs, and production data for such mills. The grade and staple length of the cotton to be used are specified and detailed costs for the processes and operations are developed. The specifications are based on modern buildings and machinery throughout, and they apply to establishments of about 10,000-spindle units operating 2 shifts per day or 80 hours per week. They are also based on prevailing wage rates in the area of the mills surveyed and apply to known machinery that has proved itself to be practicable.

Detailed cost data for a representative sample of 15 carded cotton-yarn mills were assembled and analyzed to show the influence of the various factors on costs of labor, overhead, and other items, at each stage or process of the manufacture of specified kinds of carded cotton yarn under actual operating conditions. Wide variations were found in kinds and conditions of buildings and equipment used and in organization and operation of the plants, but, taking the plants as a whole, none of the 15 mills surveyed equals the Model mills in buildings, machinery, or layout, or in simplicity of operations, although some of them approximate the Model mills in some particulars. The mills surveyed ranged widely in size and in number of counts of yarn spun, whereas the specifications for Model mills apply to plants of about 10,000 spindles, each mill to concentrate on the manufacture of only one count of yarn.

Total costs of yarns for the 15 mills surveyed, adjusted to 2 shifts per day or 80 hours per week, are substantially higher, in most instances, than those indicated for Model mills. These costs for 10s hosiery yarn, exclusive of selling expenses, ranged from 52.03 cents per pound to 55.75 cents, and averaged 53.28 cents for the mills surveyed, compared with 50.06 cents for the Model mill. In the case of 20s hosiery yarn, these costs ranged from 57.30 cents to 62.46 cents and averaged 58.74 cents, for the mills surveyed, compared with 55.97 cents for the Model mill. Differences in these costs for other yarns ranged from about the same as, to somewhat less than, those for 10s and 20s hosiery yarns.

Net cotton costs for the mills surveyed, because of differences in grade and staple length of the cotton, average lower than those indicated for Model mills, but the higher net cotton costs for Model mills are expected to be more than offset by reductions in manufacturing costs, as a result of using the higher quality of cotton. Although the problem of finding out what grade and staple length of cotton is relatively best adapted to the production of specified kinds of yarn is rather elusive, some mills apparently could increase their efficiency and reduce total costs per pound of yarn by adopting a little better quality of cotton as standard, and adjusting their drafts, speeds, and machine assignments for higher rates of production.

Total manufacturing costs, exclusive of net cotton costs, for the mills surveyed are substantially higher in most instances than those indicated for Model mills. These costs for 10s hosiery yarns, for example, ranged from 12.88 cents per pound to 17.78 cents and averaged 15.05 cents for the mills surveyed, compared with 10.54 cents for the Model mill. These differences indicate that reductions in costs of manufacturing 10s hosiery yarn, for example, would amount to as much as 69 percent for one mill, and would average about 43 percent for all the mills surveyed, if the mills surveyed should be adjusted to approximate the conditions specified for Model mills. Such reductions for other yarn would range from about the same as, to somewhat less than, those indicated for 10s hosiery yarn.

Differences in labor and overhead costs by departments for the mills surveyed indicate possibilities for improvement at each stage of processing. For 10s hosiery yarn, for example, total labor and overhead costs for the highest cost mills surveyed exceeded the corresponding costs indicated for the Model mill by amounts ranging from about 81 percent for spinning to more than 200 percent for handling and storage and for fly frames. If adjustments were made so that costs in each department for each mill surveyed would approximate those for the lowest cost operator for that department, reductions in total labor and overhead costs for 10s hosiery yarn, for example, would amount to 12 percent for the mill with lowest costs, 40 percent for the mill with highest costs, and 27 percent on the average for all mills. Adjustments to approximate the conditions indicated for Model mills would result in even greater reductions in costs.

The possibilities of bringing about reductions in labor and overhead costs for carded cotton yarns by amounts approximating the differences shown between actual costs for the mills surveyed and those indicated for Model mills appear to depend upon whether the costs indicated for Model mills are attainable under actual operating conditions. Data on labor and overhead costs by departments show that costs for the individual mills surveyed in many instances approached closely enough those for the Model mills to indicate that the costs shown for Model mills are at attainable levels under the conditions specified.

Differences in total manufacturing costs for carded cotton yarns are accounted for mainly by the difference in labor costs. Labor costs for 10s hosiery yarns, for example, ranged from 7.50 cents per pound to 11.37 cents and averaged 8.85 cents for the mills surveyed, compared with 4.50 cents for the Model mill. For 20s hosiery yarn, labor costs ranged from 10.22 cents to 14.01 cents and averaged 11.80 cents for the mills surveyed, compared with 7.05 cents for the Model mills. Differences in labor costs for other yarns range from about the same as, to somewhat less than, those indicated for 10s and 20s hosiery yarns.

These differences in labor costs are accounted for mainly by differences in quantities of yarn produced per hour of man labor, but differences in average wage rates were large enough in some instances to be of considerable importance. Production of 10s hosiery yarn, for example, per man-hour by the mills surveyed ranged from 41 percent to 66 percent and averaged 55 percent of that indicated for the Model

mill. Average hourly wage rates for labor used by the mills surveyed in the manufacture of 10s hosiery yarn ranged from about 10 percent below to 11 percent above those for the Model mill. The influence of differences in quantity of yarn produced per unit of labor on differences in labor costs per pound of yarn are offset in some instances and are supplemented in others by the influence of differences in wage rates.

Labor costs by departments show wide variations among mills, reflecting differences in quantity of products per unit of labor and in wage rates. Data on labor costs by departments show that those for the mills of highest costs exceeded the corresponding costs indicated for Model mills by amounts ranging from 110 percent for carding to more than 200 percent for handling and storage, opening and picking, fly frames, and winding, for 10s hosiery yarn; and from 71 percent for carding to more than 200 percent for fly frames, for 20s hosiery yarn. Average labor costs by departments for the mills studied exceeded those for Model mills by amounts ranging from 44 percent for drawing to 180 percent for fly frames, for 10s hosiery yarn; and from 14 percent for opening and picking to 147 percent for fly frames, for 20s hosiery yarn. In some departments, the labor costs for some of the mills were as low as or lower than those indicated for Model mills, but these relatively low costs of labor are accounted for mainly by relatively low wage rates.

Such differences in unit labor costs emphasize the importance of making adjustments to increase efficiency and to reduce these costs. If adjustments were made so that labor costs for each department in each of the mills surveyed approximated that for the operator with lowest costs for that department, total labor costs for 10s hosiery yarn, for example, would be reduced 15 percent for the lowest-cost mill, 44 percent for the highest-cost mill, and 28 percent on the average for all mills combined. Adjustment to approximate the conditions indicated for Model mills would result in even greater reductions. Such adjustments probably would require the use of new and improved machinery and equipment, and the additional costs involved might offset some of the savings in labor costs.

The principal factors contributing to maximum production per man-hour include the use of suitable kinds of cotton, the maintenance of good working conditions, a steady flow of work, the right type and quantity of modern machinery well maintained, a lay-out or arrangement of plant that makes for efficient operations and flow of materials, and an equalization of reasonable workloads as determined by competent specialists. Simplicity of operations with little changing of stocks, rovings, and counts of yarn, are also important to any mill that is trying to get maximum production per man-hour.

Overhead costs per pound for most yarns in the mills surveyed ranged from substantially below to considerably above those indicated for Model mills and averaged somewhat less. The relatively large depreciation costs for Model mills are mainly responsible for overhead costs for those mills exceeding those for the mills surveyed. But wide differences in overhead costs by departments indicate the needs for, and possibilities of, improvements. If adjustments were made so that overhead costs for each department in each mill would approxi-

mate those for the lowest cost mill for that department, total overhead costs for 10s hosiery yarns, for example, would be reduced 13 percent below that for the lowest cost mill, 48 percent below that for the highest cost mill, and 34 percent below the average for all mills included. But the fact that overhead costs for most of the mills surveyed are lower than those shown for Model mills indicates that the possibilities of reductions in overhead costs are limited.

The total of other manufacturing costs, including social security and old-age-benefit taxes, vacation pay, packing materials, and freight, averaged somewhat higher for the mills surveyed than those indicated for Model mills. Differences in these costs indicate some possibilities for improvements.

Much new and modern machinery would be required by the carded-yarn industry if any great reductions were to be made in costs of manufacturing carded cotton yarns. The types of machinery needed most are opening and picking equipment, long-draft fly frames, and long-draft larger package spinning machines.

Changes in buildings most needed for increasing efficiency and reducing costs include some rearrangement of machinery in most of the buildings now being used, the installation of evaporative cooling systems, including more modern humidifying systems, and better lighting equipment. With these improvements, the effectiveness of most of the buildings, from the viewpoint of unit cost of yarn, would approximate that of Model mills.

Increased machine assignments offer possibilities for making substantial reductions in costs of manufacturing carded cotton yarns. There is considerable variation in machine assignments and workloads among the mills in the study. In some instances the employees have what are considered full workloads, but these instances are in the minority. With more modern machinery, improved building arrangements, and better working conditions, including air cooling, the carded yarn mills should eventually be able to attain the productivity set up in the Model mills. But to do this it is necessary that the "work" run well, and that fair and reasonable standards be established to equalize the loads among all the workers.

Adjustments in size of mills and in number of counts spun offer possibilities for reductions in costs. The relationships between size of the mills and manufacturing costs indicate that some carded-yarn manufacturing establishments may be too small for the most efficient operations, particularly in the manufacture of several counts of yarn. The mills generally spin too large a range of yarn counts to permit minimum unit costs of operations. In most mills a reduction in the number of counts spun would simplify the operations and make it possible to more nearly approach the costs indicated for Model mills, which contemplate producing only one count of yarn. With such simplified operations each mill could adopt the machinery, drafts, speeds, and work loads necessary to produce higher degrees of efficiency and lower unit costs. But such simplified operations would necessitate considerable cooperation on the part of persons or organizations responsible for the sales and merchandizing of yarn and of the mill's customers or users of carded yarns.

INTRODUCTION

Earlier studies indicate that gross margins for assembling and merchandising raw cotton, manufacturing cotton fabrics, fabricating cotton apparel and household textiles, and wholesaling and retailing the finished products on the average account for about seven-eighths of the dollar paid by the consumer for cotton apparel and household textiles.² Gross margins for yarn manufacturers alone apparently account for more than 5 percent of the consumer's dollar, or about twice as much as total costs of ginning and merchandising the raw cotton that is used. The size of these margins emphasizes the importance of information to show the influence of the various factors on the efficiency and costs of the services rendered and to indicate what appears to be the most feasible means of improvement.

Research relating to marketing margins and costs constitutes an important part of the work provided for by the Research and Marketing Act of 1946. This law authorizes and directs the Secretary of Agriculture, among other things, to determine costs of marketing agricultural products in their various forms and through the various channels, and to foster and assist in the development and establishment of more efficient marketing methods, practices, and facilities for the purpose of bringing about more efficient and orderly marketing and reducing the price spread between producers and the consumers.³

Additional information relating to marketing margins and costs is needed to orient marketing problems by indicating the relative importance, from the viewpoint of costs, of the services, agencies, and cost items involved and to indicate the adjustments needed to reduce marketing costs. Research designed to develop such information for agricultural products includes that relating to farm-to-retail price spreads; to average distribution of the consumer's dollar by agencies, services, and cost items; and to factors affecting efficiency and costs of marketing and means of improvement.

Research relating to farm-to-retail price spreads is concerned mainly with the development of data to show periodically the retail values of specified farm products, the farm values of equivalent products, the spread between these farm and retail values, and the farmer's share of the retail cost to consumers. These data are in great demand for use in showing the amounts of, and changes in, over-all marketing margins and their relative importance from the viewpoint of cost.

Data on average distribution of the consumer's dollar spent for finished products, on changes in gross margins at each principal stage in marketing, and on items of cost included, are being assembled for cotton and other groups of agricultural products. This information serves as a basis for indicating the relative importance, from the viewpoint of costs, of the various stages or segments of the marketing procedure and of the agencies, services, and cost items involved. But, in the absence of any objective standards against which these margins and costs can be evaluated, these data on average gross margins and

² HOWELL, L. D. MARKETING AND MANUFACTURING MARGINS FOR TEXTILES. U. S. Dept. Agr. Tech. Bul. 891, 148 pp., illus. 1945.

BEEN, R. O. PRICE SPREADS BETWEEN FARMERS AND CONSUMERS. U. S. Dept. Agr. Inform. Bul. 4, 95 pp. illus. 1949.

³ PUBLIC LAW 733, TITLE II, SECTION 202 (B). (60 Stat. 1082).

on average costs, regardless of their accuracy, are not adequate for indicating whether the gross margins, and particular cost items, are too large or too small, or what can or should be done to increase efficiency and reduce costs.

To determine an adequate basis for constructive action would require additional research to show (1) the influence of the several factors on efficiency and costs under actual operating conditions, (2) detailed specifications for model low-cost operating units for use as a standard or basis of comparison, and (3) the changes needed to bring about improvements. The results of one approach of this kind as applied to the carded cotton-yarn manufacturing industry are presented in this report. This industry was selected for this initial study because it represents an early stage in, and an important segment of, the cotton-manufacturing industry. This segment apparently offers reasonably good opportunities for developing information that should be of assistance to operators in increasing their efficiency and reducing their costs and for developing methods and techniques applicable, with appropriate modifications, to other segments of the textile industry.

PURPOSES OF STUDY

The main purpose of this study was to show what appears to be the most feasible means of increasing the efficiency and of reducing the costs of manufacturing carded cotton yarns. Intermediate purposes were: (1) to prepare detailed specifications and to indicate operating results for Model low-cost mills designed to manufacture specified kinds of carded cotton yarns for use as a standard or basis of comparison; and (2) to assemble and analyze detailed cost data for a representative sample of 15 carded cotton-yarn mills to show the influence of the several factors on efficiency and unit costs at each stage or process of manufacturing specified kinds of carded cotton yarns under actual operating conditions. The specifications and operating results for Model mills and the results of the analysis of cost data for representative mills under actual operating conditions are intended for use in indicating the adjustments needed to increase efficiency and to reduce costs. The results of this research are given for the direct use of manufacturers of carded cotton yarns and indirectly for the benefit of the cotton industry as a whole, including farm producers and consumers of cotton products.

METHOD AND SCOPE OF STUDY

Representatives of the Carded Yarn Association, Inc., and others gave advice and assistance in determining the kinds of information that would be most helpful to manufacturers of carded cotton yarns in increasing their efficiency and in reducing their costs, the nature and sources of the data available for use in this study and the means of obtaining them, and what would appear to be the most feasible means of developing this study. The study was developed from the viewpoint that any benefits to farm producers, consumers, and the cotton industry as a whole resulting from this research would depend mainly upon the usefulness of the information to cotton-yarn manufacturers in increasing efficiency and in reducing their costs.

These manufacturers, because of their situation and experience, are considered to be in a particularly favorable position to suggest the kinds of information that would be of greatest usefulness to them for this purpose. Consequently, their advice and assistance were used to good advantage in planning and developing the study.

The nature of the carded cotton-yarn manufacturing industry is such that the best results from research relating to efficiency and costs and means of improvement for the industry would require the services of competent personnel with broad training and experience in textile cost engineering. Arrangements were made to obtain the services of such personnel through a contract with the Ralph E. Loper Co. of Greenville, S. C., to make the study.

The plan developed for this research, with the advice and assistance of representatives of the Carded Yarn Association, Inc., specified that the contractor shall perform the following work and services.

(1) Prepare detailed specifications on the basis of cost engineering data and other information for Model establishments for manufacturing typical kinds of carded cotton yarns, showing the most desirable buildings, machinery and equipment, floor plans, labor requirements, draft program, and production data; and develop for these pilot or Model mills detailed costs for the different processes and operations. These specifications were to be based on modern buildings and machinery throughout, and they were to apply to establishments of about 10,000 spindle units operating two shifts of 40 hours per week each. They were also to be based on prevailing wage rates in the area of the mills surveyed and would apply to known machinery that has been proved to be practical. The specifications are for establishments spinning (a) 10s knitting and 10s weaving yarns, using Strict Low Middling $1\frac{1}{16}$ -inch cotton; (b) 20s knitting and 20s weaving yarns, using Middling 1-inch cotton; and (c) 30s knitting and 30s weaving yarns, using Middling $1\frac{1}{2}$ -inch cotton. The specified yarns and grades and staple lengths of cotton were subject to change by mutual agreement.

It was mutually understood and agreed that the specifications for these Model establishments would be supplemented by such notes or explanatory material as may be necessary to make these specifications of maximum usefulness to manufacturers of carded knitting cotton yarns only, to manufacturers of both carded knitting cotton yarns and carded weaving cotton yarns, and to manufacturers of carded weaving cotton yarns only.

(2) Assemble detailed cost data for a representative sample of 15 carded gray cotton-yarn manufacturing establishments currently in operation, including those manufacturing gray knitting cotton yarns only, those manufacturing both carded gray knitting cotton yarns and carded gray weaving cotton yarns, and those manufacturing gray weaving cotton yarns only, in such proportions as to supply the most satisfactory basis for comparisons with specifications for Model establishments provided for under paragraph (1). The establishments for detailed study were to be selected by the contractor in consultation with representatives of the Carded Yarn Association, Inc., and the U. S. Department of Agriculture and a list of the selected mills was to be agreed upon after assurances had been obtained from

the mills chosen that they would cooperate by making available to the contractor all their records that were needed. The mills chosen for detailed study were to be selected in such a way as to constitute as nearly as possible a representative cross section of the various types of operating conditions of carded cotton-yarn mills. The records of the individual plants were to be analyzed to discover the influences of such factors as kinds of equipment and techniques used, size and organization of the business units, kinds of raw materials used, and other factors, on the efficiency and unit costs of labor, overhead, etc., at each important stage or process in the manufacture of specified kinds of yarns under actual operating conditions.

(3) Prepare an interpretive report, without disclosing the identity of individual mills. This report was to contain the specifications for the Model establishments, along with such notes and explanatory materials as are needed to make the information of maximum usefulness to carded yarn manufacturers. It was to include results of the analysis and interpretation of the data assembled for the representative sample of 15 carded gray cotton yarn mills. Its conclusions were to be based on the specifications and cost data developed for the Model establishments, on the results of the analysis of detailed cost data for the representative sample of 15 carded yarn mills, and on the contractor's best cost engineering judgment and knowledge, and on their experiences with the industry. The conclusions were to show what appear to be the most feasible means of increasing the efficiency and of reducing the costs of manufacturers of carded yarn. The results obtained under actual operating conditions were to be compared with those indicated for the Model establishments as a basis for illustrating some of the most important means of improvement.

It was understood and agreed that the contractor would use its best engineering judgment and knowledge of the industry in the performance of this assignment. The contractor was to advise with representatives of the Carded Yarn Association, Inc., and of the U. S. Department of Agriculture in formulating final plans for and in developing this research, so as to get information of maximum usefulness to carded-yarn manufacturers. The Department of Agriculture was to be kept informed regarding the progress made in developing the study.

MODEL MILLS

The term "Model mills," as used in this report, is intended to describe practical mills that can be constructed to manufacture the yarns intended, at the lowest practical total costs, including raw materials. The buildings to house the machinery are to be constructed at as low a price as possible so as to obtain the best manufacturing costs. They are to have reasonably good working conditions, and to present a good outside appearance without being spectacular. Model mills of 10,000 spindles were specified by the Department of Agriculture, after consultation with representatives of the Carded Yarn Association, Inc., because this number of spindles conforms approximately with the average size of mills that produce the yarns to be studied.

SPECIFICATIONS FOR MODEL MILLS

The machinery set-up for the Model mills is in line with the best that is now on the market and which has been used long enough to be considered practical. The costs of the machinery, which are necessarily estimates, were obtained from machinery manufacturers, or they were set up by the contractor in line with recent purchases in the industry. The number and kinds of machinery specified for the Model mills are listed on pp. 16, 20, and 25.

In preparing specifications for the building lay-outs for the Model mills, the contractor used for the manufacturing buildings one-story brick, slow-burning mill construction with evaporative cooling system; all of the area under one roof. Modern lighting and toilet facilities are provided for and the floor space is arranged for the efficient flow of materials between products with a view to obtaining maximum efficiencies and low costs of upkeep. The Ralph E. Loper Company does not engage in mill architecture or mill construction work, but the estimated cost of the mill buildings, including heating equipment, lighting, plumbing, humidification, and a cooling system was approximately \$6.50 per square foot. The estimated average cost of the warehouse space was \$3 per square foot. These figures were checked by consultations with architects who specialize in the textile industry. It will be noted that the sketches of the main building are of the "straight-line" type (see pp. 17, 21, and 26), although it is realized that there is a trend in textile construction toward the square type of building, and anyone who contemplates a new building should keep this fact in mind.

"Square type" construction is believed by some architectural engineers to make it possible, usually, to locate service facilities such as the repair shop and supply room more centrally, but it is not unanimously agreed that the square type of construction is ideal. Because of the size of these Model units (about 10,000 spindles), it seemed best to adhere to the known advantages of the straight-line buildings for purposes of this study, as this arrangement appeared to give a little lower total cost per unit of manufacturing the specified yarns, than other arrangements.

The capital requirements for setting up an operating mill of the type specified vary considerably with the fineness of the yarn produced (table 1). The estimated amounts of capital needed to set up and operate, on a two-shift or 80-hour basis, new carded cotton-yarn mills of the type specified, based on prices as of March 30, 1950, range from \$120 per spindle for 30s hosiery yarns to \$230 per spindle for 10s hosiery yarns.

If a mill similar to any of the Model mills were to be constructed, the contractor assumed that it would be located in the South and adjacent to a textile town or city, so that no company-owned mill village would be required.

The job sizes and machine assignments set up for the Model mills were to be, for each operative, a full but reasonable workload and a load that can be sustained over an indefinite period. It is expected that the "work" will run well, the lay-out of the plant will be virtually ideal, and working conditions will be maintained at a high level so as to permit these maximum assignments without overloading any of the operatives. (See pp. 16, 22, and 25.)

TABLE 1.—*Model mills: Estimated capital needed to set up and operate new carded-yarn mills, operating 80 hours per week (two shifts of 40 hours each), by kind of yarn, based on prices as of Mar. 30, 1950*¹

Item	Hosiery yarn		
	10s	20s	30s
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Land and buildings ²	531, 300	395, 400	343, 350
Machinery, erection, etc.....	1, 090, 000	730, 000	577, 000
Working capital ³	810, 000	437, 000	349, 000
Total.....	2, 431, 300	1, 562, 400	1, 269, 350
Investment per spindle.....	230	148	120

¹ Spindles number 10,584 for each mill.

² Without village.

³ Working capital estimated by assuming 10 weeks' supply of cotton paid for and constantly on hand, normal stock-in-process, 2 weeks' inventory of yarn, accounts receivable equivalent to 3 weeks' billings, normal supply inventory, and conservative amount of cash in banks.

The assignment, as given to the contractor, the Ralph E. Loper Co. by the U. S. Department of Agriculture, specified that the manufacturing costs for the Model mills should be established on the basis of prevailing wages in the area. This directive was interpreted to mean the average occupational wage rates found in the mills surveyed in this study. No overtime wage rates have been considered for purposes of the study.

The draft programs, speeds, twists, and other technical data for the Model mills were set up by the contractor, based on experience, and after consulting with the manufacturers of the machines used. (See pages 16, 22, and 25.)

The lay-outs for the hosiery and warp twist yarns in the Model mills are alike in so many instances that only the differences (wherever they occur) are indicated in this bulletin. When no reference is made to warp twist lay-outs, it may be assumed that the details—such as machinery lists, draft programs, etc.—as applied to hosiery twists, apply also to warp twists.

COSTS FOR MODEL MILLS

The total costs to manufacturers of carded cotton yarns that are indicated for Model mills, as of May 1950, amounted to 50.06 cents per pound for 10s hosiery, 50.19 cents for 10s warp, 55.97 cents for 20s hosiery, 56.27 cents for 20s warp, 61.29 cents for 30s hosiery, and 62.03 cents for 30s warp yarns. (See pp. 18, 22, and 27.) These costs include net costs of the cotton used and manufacturing costs, including labor, overhead, and other costs, such as packing materials, freight, and social security taxes.

Discounts, claim allowances, and selling expenses are not included in the cost figures, as these items vary, mostly with the selling prices of the yarns. Discounts and claim allowances are usually deducted from

the gross selling prices to arrive at net selling prices. Actual percentage selling expenses found in the mills surveyed are given on page 40 of this report. Terms for selling prices of yarn usually allow for 2-percent discount if paid on or before the tenth of the following month.

The final costs of yarn shown in this bulletin are for yarn on "cones" in all instances.

NET COTTON COSTS

Data relating to costs for the Model mills show that net cotton costs account for about 79 percent of the total costs to manufacturers for 10s yarns, about 71 percent for 20s yarns, and about 65 percent for 30s yarns. (See pp. 18, 22, and 27.) Only a small part of these differences is accounted for by differences in quality and value of the cotton used.

The grades and staple length of cotton designated for use by the Model mills in the manufacture of the yarns specified represent the qualities which, according to the opinion of the Ralph E. Loper Co., will enable the Model mills to operate on the lowest total costs, and still maintain reasonable quality of products. Data are based on the use of Middling 1-inch cotton for the Model mill for 10s yarns, Middling $1\frac{1}{2}$ -inch cotton for 20s yarns, and Middling $1\frac{1}{8}$ -inch cotton for 30s yarns. The selection of these qualities was made after the actual grades and staples of the cotton used by the 15 representative mills selected for detailed study were checked. The final designations are based on these results and on the extensive experience of the contractor with the carded cotton-yarn manufacturing industry. In designating these qualities of cotton, the contractor also took into consideration the suggested workloads, the grade and the quality of the yarns produced, and the experience in wastes that they used as standard. Preferably, the "work" should run well as the cotton used affects the workloads, the speeds, the drafts, and the quality of the yarn.

The prices of the cotton for the designated grades and staples were obtained from the Weekly Cotton Market Review for March 30, 1950.⁴ These price quotations are applicable to cotton "landed group B mill points." Prices for Middling 1-inch cotton averaged 35.29 cents per pound, Middling $1\frac{1}{2}$ -inch cotton averaged 35.64 cents, and Middling $1\frac{1}{8}$ -inch averaged 35.94 cents.

Waste multipliers for the Model mills were estimated from the experiences of the contractor, and were established after referring to the actual waste multipliers found in the 15 mills surveyed. The contractor also took into consideration the grade and staple length of the cotton indicated for making the yarns in Model mills.

The waste multiplier used—that is, 112 percent—indicates a gross waste (before credit for waste sold) of about 14 percent and a net waste of 10.8 percent, which means after credit for waste sold.

The delivered price of cotton in the bale multiplied by 112 percent equals net costs of cotton in yarn. The net cotton costs indicated for Model mills are 39.52 cents per pound for 10s yarns, 39.92 cents for 20s yarns, and 40.25 cents for 30s yarns.

⁴ UNITED STATES PRODUCTION AND MARKETING ADMINISTRATION, COTTON BRANCH. WEEKLY COTTON MARKET REVIEW, March 30, 1950. Atlanta, Ga. [Processed.]

MANUFACTURING COSTS

Manufacturing costs include labor, overhead, and other costs, such as social security and old-age benefit taxes, vacation pay, packing materials, and freight for the delivery of yarn to customers. Total manufacturing costs for Model mills averaged about 10.6 cents per pound for 10s yarns, 16.2 cents for 20s yarns, and 21.46 cents for 30s yarns. The proportion of total costs accounted for by manufacturing costs averaged about 21 percent for 10s yarns, 29 percent for 20s yarns, and 35 percent for 30s yarns. (See pp. 18, 22, and 27.)

Labor is the largest item of cost included in total manufacturing costs. The proportion of the total accounted for by labor ranged from about 43 percent for 10s yarns to 45 percent for 30s yarns. The proportion for overhead ranged from about 36 percent for 10s yarns to 44 percent for 30s yarns, and the proportions for other costs ranged from about 11 percent for 30s yarns to 21 percent for 10s yarns.

LABOR COSTS

Data on labor costs for Model mills show that these costs averaged 4.48 cents per pound, or about 9 percent of the total costs to manufacturers, for 10s yarns; 7.07 cents per pound, or 12.6 percent for 20s yarns; and 9.46 cents per pound, or more than 15 percent, for 30s yarns. (See pp. 18, 22, and 27.) Labor costs are influenced by machinery assignments and other conditions that affect the quantity of products per unit of labor used and by wage rates.

MACHINE ASSIGNMENTS, ETC.—The number of operatives needed to produce the quality and quantities expected was set up by the contractors, based on their experiences. The fact that the Model mills have a so-called ideal lay-out of buildings and working conditions, and that the machinery is the latest type of modern practical equipment was taken into consideration.

WAGES.—Wage rates vary considerably among the 15 mills surveyed but, for the purposes of this study, simple averages of the occupational wage rates for the mills producing each of the three yarn counts were used for the Model mills. The wage rates used are: \$1.0384 per hour for 10s hosiery yarn, \$1.0393 for 10s warp yarn, \$1.0376 for 20s hosiery yarn, \$1.0476 for 20s warp yarn, \$1.0539 for 30s hosiery yarn, and \$1.0602 for 30s warp yarn. Sufficient information is included in this report to enable anyone to adjust the total labor cost to any wage level desired. It is contemplated that fly frame tenders, spinning doffers, and winder tenders will be considered as paid piece work.

OVERHEAD COSTS

Overhead costs for Model mills averaged 3.86 cents per pound, or 7.7 percent of total costs to manufacturers for 10s yarns; 6.77 cents per pound, or about 12 percent for 20s yarns; and 9.48 cents per pound, or about 15 percent of the total costs to manufacturers for 30s yarns. (See pp. 18, 22, and 27.) Included in the overhead costs are the following items.

SUPPLIES AND REPAIRS.—Costs of supplies and repairs account for almost 23 percent of total overhead costs for 10s hosiery yarn, about 19 percent for 20s hosiery yarn, and 18 percent for 30s hosiery yarn. These costs were estimated by the Ralph E. Loper Co. on the basis of extensive experiences with, and intimate knowledge of, the industry, using as a guide the actual costs for these items in the 15 mills surveyed. It should be kept in mind that the specifications are for mills that are new throughout, with buildings and machinery of such a quality that costs of upkeep and repair would be at a minimum. Periodic overhauling would be performed by outside contractors and the expenses charged to this account.

POWER.—Costs of power for Model mills account for 17 percent of total overhead costs for 10s hosiery yarn, almost 19 percent for 20s hosiery yarn, and 18 percent for 30s hosiery yarn. Averages of the costs of power for the 15 mills surveyed were used as a basis for indicating these costs for the Model mills, taking into consideration the fact that all the new machinery would be of the latest type, and allowing for an air-changing and cooling system, for ceiling fans, and modern lighting of window-less buildings.

INSURANCE.—Costs of insurance make a relatively small item. Insurance for workmen's compensation was estimated on the basis of the actual experience encountered by the 15 mills surveyed and was calculated as a percentage of pay rolls. This also applies to group insurance.

INSURANCE (OTHER).—This item includes all other forms of insurance except life insurance. Estimates were made on the basis of the actual experience in the 15 mills, adjusted for the increased value of a new mill to take care of the increased cost of fire insurance.

TAXES (PROPERTY, ETC.).—Taxes, exclusive of income and social security taxes, estimated on the basis of average actual costs for this item in the 15 mills, account for about 4 percent of the total overhead costs indicated for Model mills. Property taxes in textile communities in the South vary considerably, and in some areas special tax inducements have been offered; but for purposes of this study, it was considered fair to use the average property taxes found in the mills surveyed, adjusted to an estimated figure for the Model mills of 10,000 spindle units.

DEPRECIATION.—Costs of depreciation, established by applying the rates of the Office of Internal Revenue to the estimated total costs of buildings and machinery, account for 33 percent of total overhead costs for 10s hosiery yarn, about 32 percent for 20s hosiery yarn, and about 30 percent for 30s hosiery yarn. Internal Revenue rates were used to assure maximum comparability of the results, although it is realized that these rates do not provide enough depreciation for normal replacements under present conditions. The information given in this bulletin is considered adequate for use in adjusting depreciation costs to any rates desired.

FUEL.—Fuel costs, estimated on the basis of the experiences of the contractor, using as a guide the costs as found in the 15 mills, account for only a small proportion of overhead costs for Model mills.

OTHER EXPENSES.—These expenses were estimated, based on experiences of the contractor, and after comparison with actual experiences in the mills surveyed.

SALARIES.—Total salaries for officers and executives, clerical workers, and superintendents, were set up on the basis of the experiences of the contractor, after taking into account actual salaries paid in the 15 mills surveyed. The results show that these salaries account for about 14 percent of total overhead costs for 10s hosiery yarn, 17 percent for 20s hosiery yarn, and 19 percent for 30s hosiery yarn.

No “*interest on investment*” is included in manufacturing costs for Model mills because it is not the practice at present, in this industry, to include this figure as an item of cost. No “*interest on borrowed money*” is included in manufacturing costs for the Model mills, as it is assumed that the owners or stockholders will provide the necessary funds for construction and normal operations.

OTHER COSTS

Other manufacturing costs for Model mills, including taxes for social security and old-age benefits, vacation pay, packing materials, and freight for delivery of yarn to customers, averaged 2.26 cents per pound for 10s yarns, 2.36 cents for 20s yarns, and 2.46 cents for 30s yarns. The combined amounts of these costs in Model mills averaged somewhat more than 4 percent of total costs to manufacturer.

TAXES.—Costs of taxes for social security and old-age benefits for Model mills are based on average expense for these taxes for the 15 mills surveyed. The rates are based on 1949 information before the increased rates became effective, January 1, 1950. The combined amounts of these taxes approximate 2.29 percent of the labor costs.

VACATION PAY.—Estimated costs of vacation pay in Model mills are based on the average for the 15 mills surveyed and they total 1.7 percent of labor costs. Some of these mills surveyed have liberal vacation pay policies and others have no costs for this item. Costs of vacation pay are reported separately throughout the bulletin. Anyone who wishes can adjust the costs for Model mills to include any amount.

PACKING MATERIALS.—Costs for paper, cones, strapping, etc., were estimated by the contractor, using as a guide the actual practice in the industry. These costs totaled 1 cent per pound for each kind of yarn specified.

FREIGHT.—Costs for Model mills for freight for delivery of yarn to customers were set up on the basis of the average mill's experience. For each yarn specified it was 1.08 cents per pound.

TABLE 2.—*Model mill: Machinery specified for the manufacture of 10s hosiery carded cotton yarn, United States, May 1950*¹

Kind of machinery	Quantity
Lines of opening equipment.....	2
Waste machine.....	1
Single-process pickers (2 beaters each).....	4
40-inch cards—27-inch doffers (continuous strippers).....	124
Frames:	
Drawing, 1½-inch metal rolls:	
Breaker:	
5 deliveries each.....	14
6 deliveries each.....	1
Finisher:	
5 deliveries each.....	14
6 deliveries each.....	1
Super draft, 10 inch×5 inch, 120 spindles each.....	8
Spinning, 4-inch gauge, 2½-inch ring, long draft, tape drive (with overhead cleaners and mechanical oiling sytem), 252 spindles each.....	42
Total spinning spindles=10, 584.	
Cone winders, 100 spindles each.....	5
Miscellaneous equipment, such as testing equipment, hand trucks, office furniture and fixtures, pumps, compressors, heating plant, lathes, ceiling fans, and motors.	

¹ The specifications were prepared by the Ralph E. Loper Co. for the U. S. Department of Agriculture. The size designated by the Department, after consultation with representatives of Carded Yarn Association, Inc., was 10,000 spindles because this number of spindles approximates the number in the average size of mill producing this kind of yarn. Cost of this machinery and equipment (including engineering fees, freight, etc.) was estimated, as of May 1950, at about \$1,090,000.

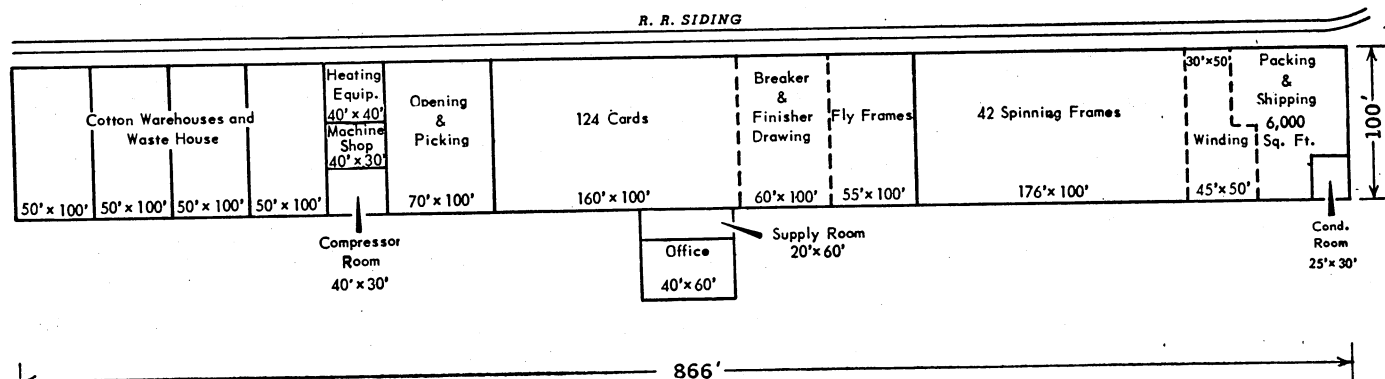
TABLE 3.—*Model mill: Operating data and draft program for 10s carded cotton yarn, United States, May 1950*

Item	Unit	10s yarn	
		Hosiery	Warp
Cotton specified:			
Grade.....		M	M
Staple length.....	Inch.....	1	1
Picker lap.....	Ounce.....	14	14
Quantity per week (40 hours).....	Pound.....	11, 850	11, 425
Card sliver.....	Grain.....	55	55
Quantity per card week (40 hours).....	Pound.....	368	368
Finisher drawing sliver.....	Grain.....	55	55
Quantity per finisher delivery week (40 hours).....	Pound.....	595	595
Slubber (1.00 hank roving):			
Revolutions per minute front roll.....		214	214
Twist multiplier.....		1. 20	1. 20
Quantity per spindle (40 hours).....	Pound.....	47. 42	47. 42
Spinning:			
Revolutions per minute front roll.....		187	179
Twist multiplier.....		3. 50	4. 50
Quantity per spindle (40 hours).....	Pound.....	4. 25	4. 10

MODEL MILL FLOOR PLAN (10s HOSIERY)

MAY 1950

Mill Building and Office	... 70,200 sq. ft.	\$456,300
Warehouses 20,000 sq. ft.	60,000
Totals 90,200 sq. ft.	\$516,300
Land	15,000
Total	\$531,300



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FIGURE 1.

TABLE 4.—*Model mill: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	10s cotton carded yarn			
	Hosiery		Warp	
	Cents	Percent	Cents	Percent
Total cost of yarn ²	50. 06	100. 0	50. 19	100. 0
Net cotton cost ³	39. 52	78. 9	39. 52	78. 7
Manufacturing cost.....	10. 54	21. 1	10. 67	21. 3
Labor ⁴	4. 50	9. 0	4. 46	8. 9
Overhead.....	3. 78	7. 6	3. 95	7. 9
Other.....	2. 26	4. 5	2. 26	4. 5
Taxes ⁵.....	. 10	. 2	. 10	. 2
Vacation pay ⁶.....	. 08	. 2	. 08	. 2
Packing materials.....	1. 00	2. 0	1. 00	2. 0
Freight.....	1. 08	2. 1	1. 08	2. 1

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Discounts and selling expenses not included.³ Middling 1-inch cotton is specified. The price, 35.29 cents per pound, was based on official quotations for cotton "landed group B mill points," Mar. 30, 1950. The price was adjusted for waste by multiplying it by 1.12, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Includes social security and old-age benefits which amount to 2.29 percent of labor cost.⁶ Amounts to 1.70 percent of labor cost.TABLE 5.—*Model mill: Overhead and labor costs for 10s hosiery carded cotton yarn, by departments, United States, May 1950*¹

Department	Cost per pound of yarn			Total payroll cost per week
	Overhead	Labor	Total	
	Cents	Cents	Cents	Dollars
Handling.....	0. 06	0. 17	0. 23	152. 03
Opening and picking.....	. 37	. 24	. 61	215. 33
Carding.....	1. 17	. 62	1. 79	558. 86
Drawing.....	. 29	. 37	. 66	330. 31
Fly frames.....	. 26	. 43	. 69	383. 31
Spinning.....	1. 29	1. 40	2. 69	1, 262. 62
Winding.....	. 28	1. 10	1. 38	989. 48
Packing and shipping.....	. 06	. 17	. 23	153. 62
Total.....	3. 78	4. 50	8. 28	4, 045. 56

¹ Costs are based on 2 shifts or 80 hours per week with an estimated production of 90,000 pounds of yarn.

TABLE 6.—*Model mill: Overhead expenses per week (2 shifts or 80-hour basis) for the manufacture of 10s hosiery carded cotton yarn, United States, May 1950*¹

Item	Total	Per spindle
	<i>Dollars</i>	<i>Cents</i>
Supplies and repairs.....	765	7. 23
Power.....	580	5. 48
Insurance, liability.....	30	. 28
Insurance, other.....	100	. 94
Taxes, property.....	137	1. 29
Depreciation.....	1, 120	10. 58
Fuel.....	45	. 43
Other expenses.....	150	1. 42
Salaries, etc.....	475	4. 49
Total.....	3, 402	32. 14

¹ Total number of spinning spindles=10,584, and estimated production is 90,000 pounds of yarn per week of 80 hours.

TABLE 7.—*Model mill: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of 10s hosiery carded cotton yarn, by occupation, United States, May 1950*¹

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Opener hands and oilers.....	80	0. 998	79. 84
Picker tenders.....	80	1. 008	80. 64
Card grinders and fixers.....	160	1. 229	196. 64
Card tenders.....	240	. 997	239. 28
Drawing tenders.....	240	1. 027	246. 48
Oilers (cards) and drawing dragger.....	80	1. 026	82. 08
Slubber tenders.....	160	1. 123	179. 68
Doffers and sweepers.....	160	. 955	152. 80
Spinning, winding, and packing:			
Spinning and winding fixers.....	80	1. 152	92. 16
Oilers and tapers.....	40	1. 026	41. 04
Roving men and sweepers.....	160	. 955	152. 80
Spinners.....	560	1. 003	561. 68
Rollpickers.....	80	. 955	76. 40
Doffers.....	240	1. 105	265. 20
Winder tenders.....	880	1. 019	896. 72
Yarn men and packers.....	160	1. 010	161. 60
Frame cleaning.....	8	. 955	7. 64

See footnote at end of table.

TABLE 7.—*Model mill: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of 10s hosiery carded cotton yarn, by occupation, United States, May 1950*¹—Continued.

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Shop and yard:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Mechanics.....	80	1.330	106.40
Mechanic helper.....	40	.943	37.72
Humidifier and air-change man.....	40	1.250	50.00
Yard men.....	160	.903	144.48
Watchman.....	40	.945	37.80
Watchman (week-end).....	48	.945	45.36
Miscellaneous:			
Night overseer.....	40	1.875	75.00
Scrubber.....	40	.903	36.12
Total or average.....	3,896	1.038	4,045.56

¹ Based on estimated production of 90,000 pounds of yarn per week of 80 hours.

TABLE 8.—*Model mill: Machinery for the manufacture of 20s hosiery carded cotton yarn, United States, May 1950*¹

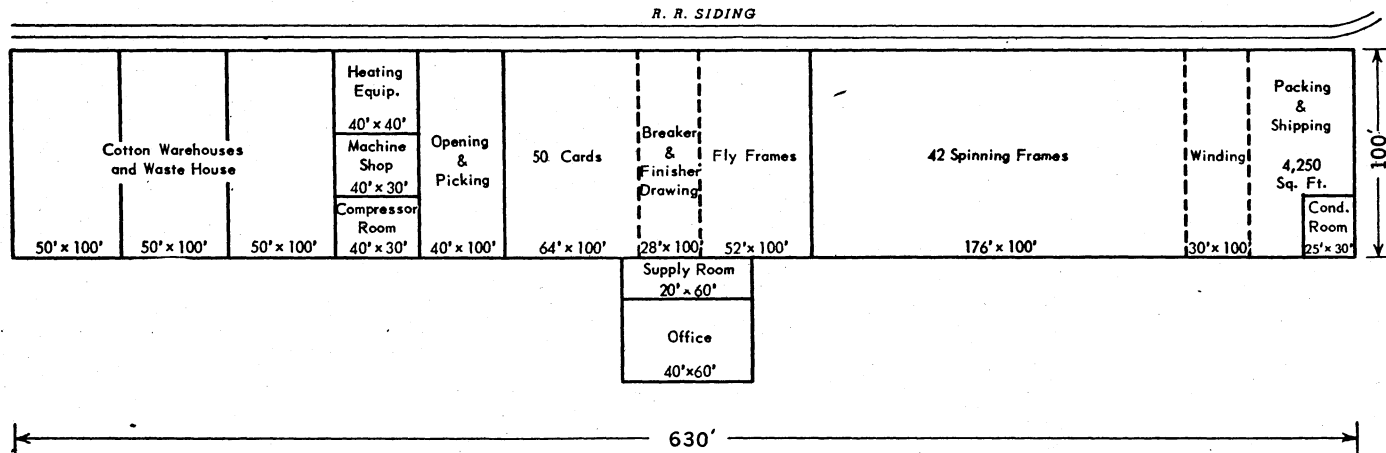
Kind of machinery	Quantity
	<i>Number</i>
Line of opening equipment.....	1
Waste machine.....	1
Single-process pickers (2 beaters each).....	2
40-inch cards—27-inch doffers (continuous strippers).....	50
Frames:	
Drawing, 1½-inch metal rolls:	
Breaker:	
4 deliveries each.....	8
Finisher:	
4 deliveries each.....	8
Long-draft slubbers, 9- by 4½-inch, 132 spindles each.....	7
Spinning, 4-inch gauge, 2¼-inch ring, long draft, tape drive (with overhead cleaners and mechanical oiling system), 252 spindles each.....	42
Total spinning spindles=10,584	
Cone winders, 100 spindles each.....	4
Miscellaneous equipment, as testing equipment, hand trucks, office furniture and fixtures, pumps, compressors, heating plant, lathes, ceiling fans, and motors.	

¹ The specifications were prepared by the Ralph E. Loper Co. for the U. S. Department of Agriculture. The size designated by the Department, after consultation with representatives of Carded Yarn Association, Inc., was 10,000 spindles because this number of spindles approximates the average size of mill producing this kind of yarn. Cost of this machinery and equipment (including engineering fees, freight, etc.) was estimated, as of May 1950, at about \$730,000.

MODEL MILL FLOOR PLAN (20s HOSIERY)

MAY 1950

Mill Building and Office	...	51,600 sq. ft.	...	\$335,400
Warehouses	15,000 sq. ft.	...	45,000
Totals	66,600 sq. ft.	...	\$380,400
Land			15,000
Total			\$395,400



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FIGURE 2.

TABLE 9.—*Model mill: Operating data and draft program for 20s carded cotton yarn, United States, May 1950*

Item	Unit	20s yarn	
		Hosiery	Warp
Cotton specified:			
Grade.....		M	M
Staple length.....	Inch.....	1½ ₂	1½ ₂
Picker lap.....	Ounce.....	14	14
Quantity per week (40 hours).....	Pound.....	9, 600	9, 350
Card sliver.....	Grain.....	55	55
Quantity per card week (40 hours).....	Pound.....	368	368
Finisher drawing sliver.....	Grain.....	55	55
Quantity per finisher delivery week (40 hours).....	Pound.....	575	575
Slubber (2.00 hank roving):			
Revolutions per minute, front roll.....		164	164
Twist multiplier.....		1. 20	1. 20
Quantity per spindle (40 hours).....	Pound.....	19. 55	19. 55
Spinning:			
Revolutions per minute, front roll.....		148	142
Twist multiplier.....		3. 50	4. 50
Quantity per spindle (40 hours).....	Pound.....	1. 70	1. 66

TABLE 10.—*Model Mill: Average cost per pound indicated for specified kinds of carded cotton yarn, United States, May 30, 1950*¹

Item	20s cotton carded yarn			
	Hosiery		Warp	
	Cents	Percent	Cents	Percent
Total cost of yarn ²	55. 97	100. 0	56. 27	100. 0
Net cotton cost ³	39. 92	71. 3	39. 92	70. 9
Manufacturing cost.....	16. 05	28. 7	16. 35	29. 1
Labor ⁴	7. 05	12. 6	7. 09	12. 6
Overhead.....	6. 64	11. 9	6. 90	12. 3
Other.....	2. 36	4. 2	2. 36	4. 2
Taxes ⁵.....	. 16	. 3	. 16	. 3
Vacation pay ⁶.....	. 12	. 2	. 12	. 2
Packing materials.....	1. 00	1. 8	1. 00	1. 8
Freight.....	1. 08	1. 9	1. 08	1. 9

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Discounts and selling expenses not included.³ Middling 1½₂-inch cotton was specified. The price, 35.64 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.12 percent, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Includes social security and old-age benefits which amount to 2.29 percent of labor cost.⁶ Amounts to 1.70 percent of labor cost.

TABLE 11.—*Model mill: Overhead and labor costs for 20s hosiery carded cotton yarn, by departments, United States, May 1950*¹

Department	Cost per pound of yarn			Total payroll cost per week
	Overhead	Labor	Total	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>
Handling and storage.....	0. 09	0. 21	0. 30	77. 05
Opening and picking.....	. 51	. 36	. 87	129. 10
Carding.....	1. 25	. 76	2. 01	273. 62
Drawing.....	. 32	. 33	. 65	119. 96
Fly frames.....	. 59	. 74	1. 33	266. 70
Spinning.....	3. 22	2. 88	6. 10	1, 036. 45
Winding.....	. 53	1. 57	2. 10	563. 86
Packing and shipping.....	. 13	. 20	. 33	73. 36
Total.....	6. 64	7. 05	13. 69	2, 540. 10

¹ Costs are based on 2 shifts or 80 hours per week with an estimated production of 36,000 pounds of yarn.

TABLE 12.—*Model mill: Overhead expenses per week (2 shifts or 80-hour basis) for the manufacture of 20s hosiery carded cotton yarn, United States, May 1950*¹

Item	Total	Per spindle
	<i>Dollars</i>	<i>Cents</i>
Supplies and repairs.....	450. 00	4. 25
Power.....	450. 00	4. 25
Insurance, liability.....	19. 05	. 18
Insurance, other.....	65. 10	. 62
Taxes, property.....	88. 90	. 84
Depreciation.....	760. 00	7. 18
Fuel.....	31. 75	. 30
Other expenses.....	126. 00	1. 19
Salaries, etc.....	400. 00	3. 78
Total.....	2, 390. 80	22. 59

¹ Total number of spinning spindles = 10,584 and estimated production of 36,000 pounds of yarn per week of 80 hours.

TABLE 13.—*Model mill: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of 20s hosiery carded cotton yarn, by occupation, United States, May 1950*¹

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Opening and picker hands.....	80	0. 977	78. 16
Card grinders and fixers.....	80	1. 192	95. 36
Card tenders.....	80	. 980	78. 40
Drawing tenders.....	80	1. 017	81. 36
Oilers (carding and spinning).....	80	1. 013	81. 04
Slubber tenders.....	160	1. 133	181. 28
Lap rackers, sweepers, and drawing haulers.....	80	. 970	77. 60
Spinning, winding, and packing:			
Spinning and winding fixers.....	80	1. 145	91. 60
Roving men and sweepers.....	80	. 946	75. 68
Spinners.....	560	. 986	552. 16
Doffers and blow-off men.....	160	1. 093	174. 88
Winder tenders.....	480	. 980	470. 40
Yarn men and packers.....	80	. 991	79. 28
Shop and yard:			
Mechanic.....	40	1. 625	65. 00
Mechanic helper.....	40	1. 125	45. 00
Humidifier and air-change man.....	40	1. 250	50. 00
Yard men.....	80	. 883	70. 64
Watchman.....	40	. 922	36. 88
Watchmen (week-end).....	48	. 922	44. 26
Miscellaneous:			
Night overseer.....	40	1. 875	75. 00
Scrubber.....	40	. 903	36. 12
Total or average.....	2, 448	1. 038	2, 540. 10

¹ Based on estimated production of 36,000 pounds of yarn per week of 80 hours.

TABLE 14.—*Model mill: Machinery for the manufacture of 30s hosiery carded cotton yarn, United States, May 1950*¹

Kind of machinery	Quantity
	Number
Line of opening equipment.....	1
Waste machine.....	1
Single-process pickers (2 beaters each).....	2
40-inch cards—27-inch doffers (continuous strippers).....	31
Frames:	
Drawing, 1½-inch metal rolls:	
Breaker:	
4 deliveries each.....	5
Finisher:	
4 deliveries each.....	5
Super draft, 8 inch X 4 inch, 112 spindles each.....	8
Spinning, 3¼-inch gauge, 2-inch ring, long draft, tape drive (with overhead cleaners and mechanical oiling system), 252 spindles each.....	42
Total spinning spindles-10,584.....	
Cone winders, 100 spindles each.....	4
Miscellaneous equipment, as testing equipment, hand trucks, office furniture and fixtures, pumps, compressors, heating plant, lathes, ceiling fans, and motors.	

¹ The specifications were prepared by the Ralph E. Loper Co. for the U. S. Department of Agriculture. The size designated by the Department, after consultation with representatives of Carded Yarn Association, Inc., was 10,000 spindles because this number approximates the average size of mill producing this kind of yarn. Cost of this machinery and equipment (including engineering fees, freight, etc.) was estimated, as of May 1950, at about \$577,000.

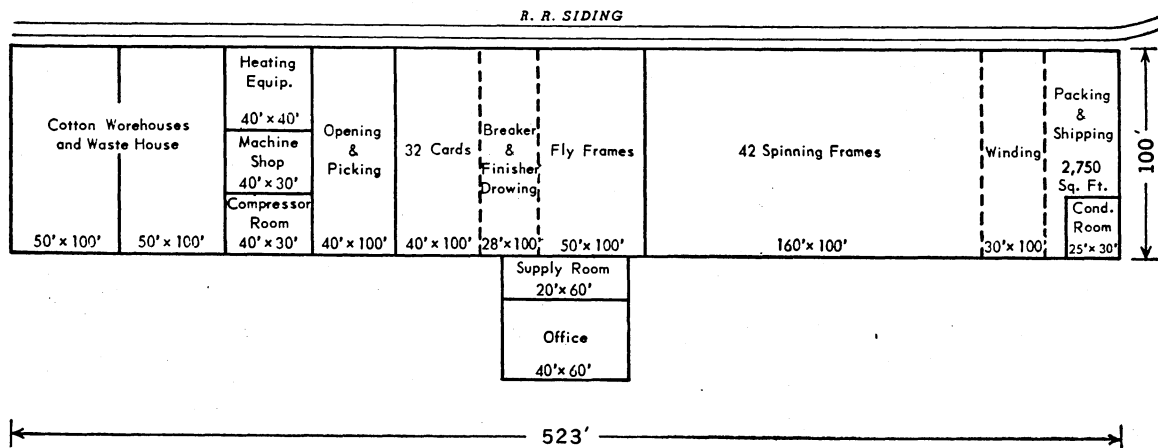
TABLE 15.—*Model mill: Operating data and draft program for 30s carded cotton yarn, United States, May 1950*

Item	Unit	30s yarn	
		Hosiery	Warp
Cotton specified:			
Grade.....		M	M
Staple length.....	Inch.....	1½	1½
Picker lap.....	Ounce.....	14	14
Quantity per week (40 hours).....	Pound.....	11, 850	11, 100
Card sliver.....	Grain.....	55	55
Quantity per card week (40 hours).....	Pound.....	368	368
Finisher drawing sliver.....	Grain.....	55	55
Quantity per finisher delivery week (40 hours).....	Pound.....	570	570
Slubber (3.00 hank roving):			
Revolutions per minute, front roll.....		155	155
Twist multiplier.....		1. 20	1. 20
Quantity per spindle (40 hours).....	Pound.....	12. 75	12. 75
Spinning:			
Revolutions per minute, front roll.....		136	127
Twist multiplier.....		3. 50	4. 50
Quantity per spindle (40 hours).....	Pound.....	1. 06	1. 00

MODEL MILL FLOOR PLAN (30s HOSIERY)

MAY 1950

Mill Building and Office	... 45,900 sq. ft. ...	\$298,350
Warehouses	..... 10,000 sq. ft. ...	<u>30,000</u>
Totals	..... 55,900 sq. ft. ...	<u>\$328,350</u>
Land	.....	<u>15,000</u>
Total	.....	<u>\$343,350</u>



U. S. DEPARTMENT OF AGRICULTURE

NEG. 47982 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 3.

TABLE 16.—*Model mill: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	30s carded cotton yarn			
	Hosiery		Warp	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ²	61. 29	100. 0	62. 03	100. 0
Net cotton cost ³	40. 25	65. 7	40. 25	64. 9
Manufacturing cost:	21. 04	34. 3	21. 78	35. 1
Labor ⁴	9. 44	15. 4	9. 49	15. 3
Overhead	9. 14	14. 9	9. 83	15. 8
Other	2. 46	4. 0	2. 46	4. 0
Taxes ⁵ .....	. 22	. 3	. 22	. 4
Vacation pay ⁶ .....	. 16	. 3	. 16	. 3
Packing materials	1. 00	1. 6	1. 00	1. 6
Freight	1. 08	1. 8	1. 08	1. 7

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ Middling 1½-inch cotton was specified. The price, 35.94 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.12, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Includes social security and old-age benefits which amount to 2.29 percent of labor cost.

⁶ Amounts to 1.70 percent of labor cost.

TABLE 17.—*Model mill: Overhead and labor costs for 30s hosiery carded cotton yarn, by departments, United States, May 1950*¹

Department	Cost per pound of yarn			Total payroll cost per week
	Overhead	Labor	Total	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Dollars</i>
Handling and storage	0. 08	0. 18	0. 26	40. 49
Opening and picking .....	. 60	. 33	. 93	75. 28
Carding	1. 30	. 89	2. 19	201. 25
Drawing .....	. 40	. 46	. 86	103. 40
Fly frames .....	. 89	1. 06	1. 95	239. 53
Spinning	4. 84	4. 22	9. 06	948. 30
Winding .....	. 88	2. 09	2. 97	468. 92
Packing and shipping .....	. 15	. 21	. 36	47. 53
Total	9. 14	9. 44	18. 58	2, 124. 70

¹ Costs are based on 2 shifts or 80 hours per week with an estimated production of 90,000 pounds of yarn.

TABLE 18.—*Model mill: Overhead expenses per week (2 shifts or 80-hour basis) for the manufacture of 30s hosiery carded cotton yarn, United States, May 1950*¹

Item	Total	Per spindle
	<i>Dollars</i>	<i>Cents</i>
Supplies and repairs.....	371. 25	3. 51
Power.....	365. 00	3. 45
Insurance, liability.....	15. 95	. 15
Insurance, other.....	55. 00	. 52
Taxes, property.....	75. 00	. 71
Depreciation.....	620. 00	5. 86
Fuel.....	28. 00	. 26
Other expenses.....	126. 00	1. 19
Salaries, etc.....	400. 00	3. 78
Total.....	2, 056. 20	19. 43

¹ Total number of spinning spindles=10,584; and estimated production 22,500 pounds of yarn per week of 80 hours.

TABLE 19.—*Model mill: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of 30s hosiery carded cotton yarn, by occupation, United States, May 1950*¹

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Carding:			
Opening and picker hand.....	40	1. 003	40. 12
Card grinders and fixers.....	80	1. 217	97. 36
Card tenders.....	80	. 997	79. 76
Drawing tenders.....	80	1. 039	83. 12
Slubber tenders.....	160	1. 142	182. 72
Spinning, winding, and packing:			
Spinning and winding fixers.....	80	1. 200	96. 00
Oilers and taper.....	40	1. 021	40. 84
Spinners.....	480	1. 015	487. 20
Roll cleaner.....	40	. 950	38. 00
Doffers (37 frames).....	80	1. 072	85. 76
Doffers (5 frames), roving men, and sweepers.....	80	1. 000	80. 00
Winder tenders.....	400	. 973	389. 20
Packer.....	40	1. 001	40. 04
Week-end cleaning.....	8	. 910	7. 28
Shop and yard:			
Mechanic.....	40	1. 453	58. 12
Mechanic helper.....	40	. 960	38. 40
Humidifier and air-change man.....	40	1. 250	50. 00
Yard man.....	40	. 917	36. 68
Watchman.....	40	. 943	37. 72
Watchman (week end).....	48	. 943	45. 26
Miscellaneous:			
Night overseer.....	40	1. 875	75. 00
Scrubber.....	40	. 903	36. 12
Total or average.....	2, 016	1. 054	2, 124. 70

¹ Based on production of 22,500 pounds of yarn per week of 80 hours.

REPRESENTATIVE MILLS SURVEYED

The 15 mills included in the sample for detailed analysis were selected to constitute as nearly as possible a representative cross section of the various types of operations in carded cotton-yarn mills. The survey was started by visiting the operators of the selected mills and making them acquainted with the purpose of the study and the data needed. A member of the staff of the Ralph E. Loper Company then visited each plant, collected the necessary data, made a brief inspection of the plant, reviewed the audit reports to learn the previous history with reference to expenditure, collected actual samples of the cotton used, and obtained samples of the yarns being manufactured.

Samples of the cotton being used by each mill were obtained for use in learning its grade and staple length. The samples from each mill were divided into three parts. One part was sent to the Cotton Review Board of the United States Department of Agriculture at Washington, D. C.; one part to the Cotton Review Board of the United States Department of Agriculture at Columbia, S. C.; and one part to an independent but competent cotton classer. The results of the three classifications of the split samples were averaged to obtain a fair appraisal of the grade and staple length of the cotton used by each mill. The results show that the grades ranged from Strict Low Middling to Strict Middling, and that the length of staple ranged from $1\frac{1}{8}$ inch to $1\frac{1}{2}$ inches (table 20). The cotton used by the mills surveyed averaged about the same in grade as that indicated for the Model mills and somewhat shorter in staple.

Samples of yarn manufactured by the several mills were obtained for laboratory test to find the count, strength, and appearance of the yarns. These samples were forwarded for analysis and testing to the laboratory that is located at Clemson College, S. C., and operated by the Research and Testing Division of the Cotton Branch of the Production and Marketing Administration in the United States Department of Agriculture. The results show considerable differences in the count, strength, and appearance of the yarns (table 21). These differences, along with other factors, may help to account for differences in the processing costs shown.

SIZE AND ARRANGEMENT OF PLANT

Descriptions of each of the 15 individual plants for which detailed data were obtained are not given in this bulletin because they might possibly serve to identify individual concerns. But a general description of the 15 mills, taken as a group, is presented as a basis for understanding the differences in costs shown and for indicating the needs for improvement.

The mills surveyed vary considerably with regard to size, as indicated by the number of spindles in place and number of counts spun. Four of the mills have less than 7,000 spindles each and are designated in this bulletin as small, 8 have between 7,000 and 14,000 spindles and are designated as medium, and 3 have 14,000 to 25,000 spindles each and are designated as large. Results for mills of these size groups are compared with results indicated for the Model mills with about 10,000 spindles. With regard to the number of counts spun, 3 mills

TABLE 20.—Average grade and staple length of cotton used in the manufacture of carded cotton yarns by 15 mills surveyed, and those specified for Model mills, by kind of yarn, United States, May 1950¹

Mill	Kind of yarn											
	10s hosiery		20s hosiery		30s hosiery		10s warp		20s warp		30s warp	
	Grade ²	Staple length	Grade ²	Staple length	Grade ²	Staple length	Grade ²	Staple length	Grade ²	Staple length	Grade ²	Staple length
	M	Inches 1+	M	Inches 1+		Inches	M	Inches 1+	M	Inches 1+		Inches
B-----									SLM+	1	M-	1½ ₂
C-----									M-	1½ ₂		
D-----												
F-----	SM	¾ ₂	SM	¾ ₂								
H-----	M-	1	M-	1	M-	1+	M-	1	M-	1		
I-----												
J-----	M+	1	M+	1	M+	1						
K-----	M-	1½ ₂ +	M-	1½ ₂ +	M-	1½ ₂ +	M-	1½ ₂ +	M-	1½ ₂ +	M-	1½ ₂ +
N-----	SLM+	1½ ₂ +	SLM+	1½ ₂ +			SLM+	1½ ₂ +	SLM+	1½ ₂ +		
O-----			M	1½ ₂	M	1½ ₂						
R-----	SLM+	1½ ₂	SLM+	1½ ₂								
S-----	M-	1½ ₁₆ +					M-	1½ ₁₆ +				
T-----	M+	1½ ₁₆	M+	1½ ₁₆								
U-----			M	1½ ₂ +	M	1½ ₂ +						
V-----	SM	¾ ₂										
Average-----	M	¾ ₂ +	M	1+	M	1+	M-	1	M-	1+	M-	1½ ₂ +
Model ³ -----	M	1	M	1½ ₂	M	1½ ₁₆	M	1	M	1½ ₂	M	1½ ₁₆

¹ The grade and staple length indicated for each of the mills represent an average of the classification of split samples by the Cotton Review Board of the U. S. Department of Agriculture at Washington, D. C.; by the Cotton Review Board of the U. S. Department of Agriculture at Columbia, S. C.; and by independent but competent cotton classers. A plus (+) following a grade or

staple-length designation indicates slightly higher grade or slightly longer staple and a minus (-) following these designations indicates slightly lower grade or slightly shorter staple.

² M means Middling; SM, Strict Middling; and SLM, Strict Low Middling.

³ Grade and staple length used in estimating costs for Model mills.

TABLE 21.—*Quality of yarn spun as indicated by count, average yarn-skein strength, break factor, and grade, by 15 mills surveyed, and by kind of yarn, United States, May 1950*¹

Mill	Yarn count		Average yarn-skein strength		Break factor	Grade or yarn appearance
	Specified	Actual	Actual	Corrected to specified count		
B..... H..... S..... V..... F..... J..... K..... N..... R..... T..... I..... O..... U..... B..... C..... H..... K..... D.....	10s hosiery yarn					
	Number	Number	Pounds	Pounds		
	11	11.5	170.6	179.3	1962	C+
	9	9.7	192.6	208.7	1868	B
	9	9.7	166.0	180.4	1610	B
	9	9.5	208.6	220.4	1982	B
	20s hosiery yarn					
	20	20.1	93.3	93.7	1875	C+
	20	19.5	99.3	96.4	1936	C
	20	20.0	91.0	90.9	1820	C+
	19	19.1	103.1	103.8	1969	C
	20	19.4	102.7	98.8	1992	C
	20	19.6	89.4	87.1	1752	C+
	30s hosiery yarn					
	30	29.1	57.6	55.3	1676	C+
	30	28.6	69.5	65.3	1988	C+
	30	29.4	62.4	60.6	1835	C+
	20s warp yarn					
	18	18.7	102.8	107.7	1922	C+
20	19.6	90.4	88.3	1772	D+	
18	19.1	106.9	115.0	2042	C+	
21	19.2	108.8	97.7	2089	C	
30s warp yarn						
Number	Number	Pounds	Pounds			
30	29.6	58.9	57.9	1743	D	

¹ Results based on analysis of samples of yarn forwarded to the laboratory of the U. S. Department of Agriculture, PMA, Research and Testing Division of Cotton Branch, Clemson, S. C. Samples from some of the yarns were not available.

spin from 1 to 3 counts each and are designated as low, 9 spin from 4 to 12 counts each and are designated as medium, and 3 spin more than 12 counts each and are designated as large. Results of mills spinning these numbers of counts are compared with the results of the Model mills which are intended to concentrate on the spinning of only one count.

The mills surveyed are listed by size groups and by numbers of counts spun as follows:

<i>Mill</i>	<i>Mill Size</i>	<i>Counts spun</i>
B.....	Small.....	Low.
C.....	Medium.....	Do.
D.....	Small.....	Do.
F.....	Medium.....	Medium.
H.....	Do.....	Large.
I.....	Do.....	Medium.
J.....	Large.....	Do.
K.....	Do.....	Large.
N.....	Medium.....	Do.
O.....	Do.....	Medium.
R.....	Do.....	Do.
S.....	Small.....	Do.
T.....	Do.....	Do.
U.....	Large.....	Do.
V.....	Medium.....	Do.

Nine of the 15 mills are located in North Carolina, 2 in South Carolina, and 4 in Alabama. Eleven of these mills are housed in 1-story buildings, 8 in buildings of the straight-line type, and all are housed in buildings made of brick, approximately of the type suggested for the Model mills. None of the buildings are new and modern; those for 12 of the mills are not new but are fairly well laid out in most aspects and are in good condition; those for 3 mills are not modern and appear to be in need of considerable alteration and repair.

The floor spacing and arrangement of machinery and equipment for efficient flow of materials between products are considered good for 5 of these mills, fair for 7, and poor for 3 of the mills. In 12 of the mills the cotton warehouses and waste houses are conveniently located with regard to the opening and picking rooms; the arrangement for 2 mills is only fair in this respect, and that for 1 mill is poor enough to reduce efficiency materially. None of the mills surveyed has an operative cooling system, 12 have good humidifying systems, 13 have fair-to-modern overhead lighting, and all have reasonably good toilet facilities.

Among the most important improvements needed in the buildings are evaporative cooling and humidification systems and better lighting. Such improvements, it is thought, would give better working conditions and enable the operatives to maintain reasonable job assignments. This should mean that the work would run better and

usually would result in improved quality of the products. Improvements in arrangement of floor area is needed to permit a straight-line flow of materials all the way from the opening of the cotton bale to the shipping of the finished products. Improvements in location or arrangement of the service facilities (such as machine shop, supply room, and office) are needed to make them more convenient to the operating units.

MACHINERY USED

To avoid the identification of individual concerns, no detailed listings of the machinery used by any of the 15 mills are included in this bulletin. But information for the 15 mills taken as a group relating to the type, amounts, and condition of machinery used at each stage in processing is presented as a basis for interpreting the differences in costs shown and for indicating improvements needed.

The type, amount, and condition of the opening and picking equipment used by 8 of the mills compare favorably in most respects with that indicated for the Model mills; the equipment used by 4 of the mills is not of the most improved type but is in good condition; and the equipment used by 3 mills is not modern and is not in very good condition. The breaker and finisher draw frames for 10 of the mills compare favorably with the machines specified for the Model mills, those for 2 of the mills are of the same general type but are rather old, and those for 3 of the mills are quite old and are not in good condition.

Five of the mills have modern fly frame equipment; one has semi-modern equipment; and the equipment for 9 of the mills is not modern. Spinning equipment for one of the mills is very nearly equal to that indicated for Model mills; 1 of the mills has a partial installation of modern spinning equipment; that for the other 13 mills is not modern. All the mills were found to have modern or semimodern winding equipment.

OPERATING DATA AND DRAFT PROGRAMS

Comparisons of the operating data and draft programs for the 15 mills with those specified for Model mills show that there are important differences in this respect (tables 22, 23, 24, and 25). The Model mills in all instances contemplate using maximum package sizes and manufacturing the yarns from one process of fly frames, with double roving in the spinning creels. Of the 10 mills surveyed that produce 10s hosiery yarn, 6 use the same size fly-frame package, but none of the mills spins as large a spinning package as is indicated for the Model mill. One of these mills uses one process of fly frames, but the package size is considerably smaller than that indicated for the Model mill. Three of the plants use two processes of fly frames which place them at considerable disadvantage in costs.

TABLE 22.—Operating data and draft program for mills surveyed and for Model mill, for 10s hosiery carded cotton yarn, United States, May 1950

Item	Unit	Mill B	Mill F	Mill H	Mill J	Mill K	Mill N
Cotton used:							
Grade ¹		M	SM	M—	M+	M—	SLM+
Staple length ²	Inch	1+	$1\frac{3}{32}$	1	1	$1\frac{1}{32}+$	$1\frac{1}{32}+$
Picker lap	Ounce	14	14.5	13	14	14	14
Quantity per picker week ³	Pound	7,223	10,580	10,879	12,661	7,276	10,165
Card sliver	Grain	52.5	65	57	55	60	55
Quantity per card week ³	Pound	327	265	350	396	275	363
Finisher drawing sliver	Grain	56.5	67	60	55	60	55
Quantity per finisher delivery week ³	Pound	345	434	518	670	627	727
Slubber (first process): Hank roving		1.50	.70	1.20	1.48	.60	1.50
Speeder (second process): Hank roving			1.85			1.40	
Spinning:							
Revolutions per minute, front roll		179	200	180	182	185	180
Twist multiplier		3.50	3.20	3.00	3.15	3.30	3.21
Quantity per spindle week ³	Pound	3.85	4.29	3.90	3.92	3.97	3.87

Item	Unit	Mill R	Mill S	Mill T	Mill V	Model mill
Cotton used:						
Grade ¹		SLM+	M—	M+	SM	M
Staple length ²	Inch	$1\frac{1}{32}$	$1\frac{1}{16}+$	$1\frac{1}{16}$	$1\frac{3}{32}$	1
Picker lap	Ounce	14	14	14	14	14
Quantity per picker week ³	Pound	8,138	12,305	11,238	11,770	11,850
Card sliver	Grain	53	56	55	57	55
Quantity per card week ³	Pound	283	405	357	460	368
Finisher drawing sliver	Grain	56.5	52	55	57	55
Quantity per finisher delivery week ³	Pound	485	733	549	679	595
Slubber (first process): Hank roving		2.20	1.00	.95	2.00	1.00
Speeder (second process): Hank roving				2.00		
Spinning:						
Revolutions per minute, front roll		185	190	200	181	187
Twist multiplier		3.25	3.35	3.50	3.40	3.50
Quantity per spindle week ³	Pound	4.06	3.86	4.41	3.81	4.25

¹ Plus (+) indicates slightly higher grade and minus (—) slightly lower grade.² Plus (+) indicates slightly longer staple.³ Week of 40 hours.

TABLE 23.—Operating data and draft program for mills surveyed and for Model mill, for 20s hosiery carded cotton yarn, United States, May 1950

Item	Unit	Mill B	Mill F	Mill H	Mill I	Mill J	Mill K
Cotton used:							
Grade ¹		M	SM	M—	M—	M+	M—
Staple length ²	Inch	1+	1½	1	1+	1	1½+
Picker lap	Ounce	14	14.5	13	13.20	14	14
Quantity per picker week ³	Pound	7,223	10,580	10,879	9,511	12,661	7,276
Card sliver	Grain	52.5	65	57	58	55	60
Quantity per card week ³	Pound	327	265	350	266	396	275
Finisher drawing sliver	Grain	56.5	67	60	58	55	60
Quantity per finisher delivery week ³	Pound	345	434	518	612	670	627
Slubber (first process): Hank roving		3.32	.85	1.80	1.25	2.75	.60
Speeder (second process): Hank roving			2.35		4.00		2.00
Spinning:							
Revolutions per minute, front roll		156	167	156	156	187	162
Twist multiplier		3.50	3.66	3.20	3.25	3.08	3.30
Quantity per spindle week ³	Pound	1.71	1.81	1.72	1.69	2.06	1.76
		Mill N	Mill O	Mill R	Mill T	Mill U	Model mill
Cotton used:							
Grade ¹		SLM+	M	SLM+	M+	M	M
Staple length ²	Inch	1½+	1½	1½	1½+	1½+	1½
Picker lap	Ounce	14	13.5	14	14	14	14
Quantity per picker week ³	Pound	10,165	9,363	8,138	11,238	12,840	9,600
Card sliver	Grain	55	52	53	55	50	55
Quantity per card week ³	Pound	363	259	283	357	242	368
Finisher drawing sliver	Grain	55	53	56.5	55	48	55
Quantity per finisher delivery week ³	Pound	727	496	485	549	492	575
Slubber (first process): Hank roving		2.40	.90	2.20	0.95	1.60	2.00
Speeder (second process): Hank roving			2.25		2.40	5.00	
Spinning:							
Revolutions per minute, front roll		150	162	138	169	156	148
Twist multiplier		3.44	3.35	3.00	3.50	3.38	3.50
Quantity per spindle week ³	Pound	1.65	1.78	1.55	1.91	1.72	1.70

¹ Plus (+) indicates slightly higher grade and minus (—) slightly lower grade.

² Plus (+) indicates slightly longer staple.

³ Week of 40 hours.

TABLE 24.—Operating data and draft program for mills surveyed and for Model mill, for 30s hosiery and 10s warp carded cotton yarn, United States, May 1950

Item	Unit	30s hosiery yarn					
		Mill I	Mill J	Mill K	Mill O	Mill U	Model mill
Cotton used:							
Grade ¹		M—	M+	M—	M	M	M
Staple length ²	Inch	1+	1	1½+	1½ ²	1½ ² + 14	1½ ⁶ 14
Picker lap	Ounce	13. 20	14	14	13. 5	14	14
Quantity per picker week ³	Pound	9, 511	12, 661	7, 276	9, 363	12, 800	11, 850
Card sliver	Grain	58	55	60	52	50	55
Quantity per card week ³	Pound	266	396	235	259	242	368
Finisher drawing sliver	Grain	58	55	60	53	48	55
Quantity per finisher delivery week ³	Pound	612	670	627	496	492	570
Slubber (first process): Hank roving		1. 25	3. 25	1. 10	1. 28	1. 60	3. 00
Speeder (second process): Hank roving		4. 00		3. 50	3. 85	5. 00	
Spinning:							
Revolutions per minute, front roll		144	148	151	152	144	136
Twist multiplier		3. 35	3. 28	3. 30	3. 50	3. 41	3. 50
Quantity per spindle week ³	Pound	1. 08	1. 12	1. 12	1. 13	1. 08	1. 06
10s warp yarn							
		Mill B	Mill H	Mill K	Mill N	Mill S	Model mill
Cotton used:							
Grade ¹		M	M—	M—	SLM+	M—	M
Staple length ²	Inch	1+	1	1½+ 14	1½+ 14	1½ ⁶ 14	1 14
Picker lap	Ounce	14	13	14	14	14	14
Quantity per picker week ³	Pound	7, 223	10, 879	7, 276	10, 165	12, 305	11, 425
Card sliver	Grain	52. 5	57	60	55	56	55
Quantity per card week ³	Pound	327	350	301	363	405	368
Finisher drawing sliver	Grain	56. 5	60	60	55	52	55
Quantity per finisher delivery week ³	Pound	345	518	627	727	733	595
Slubber (first process): Hank roving		1. 50	1. 80	. 60	1. 50	1. 00	1. 00
Speeder (second process): Hank roving				1. 40			
Spinning:							
Revolutions per minute, front roll		155	179	158	180	166	179
Twist multiplier		4. 75	4. 50	4. 40	4. 22	4. 75	4. 50
Quantity per spindle week ³	Pound	3. 40	3. 97	3. 39	3. 87	3. 40	4. 10

¹ Plus (+) indicates slightly higher grade and minus (—) slightly lower grade.

² Plus (+) indicates slightly longer staple.

³ Week of 40 hours.

TABLE 25.—Operating data and draft program for mills surveyed and for Model mill, for 20s and 30s warp carded cotton yarn, United States, May 1950

Item	Unit	20s warp yarn				
		Mill B	Mill C	Mill D	Mill H	Mill K
Cotton used:						
Grade ¹		M	SLM +	M—	M—	M—
Staple length ²	Inch.....	1+	1	1½	1	1½+
Picker lap.....	Ounce.....	14	14. 33	13. 50	13	14
Quantity per picker week ³	Pound.....	7, 223	8, 293	14, 552	10, 879	7, 276
Card sliver.....	Grain.....	52. 5	66	53	57	60
Quantity per card week ³	Pound.....	327	396	347	350	301
Finisher drawing sliver.....	Grain.....	56. 5	66	53	60	60
Quantity per finisher delivery week ³	Pound.....	345	565	478	518	627
Slubber (first process): Hank roving.....		3. 32	2. 04	1. 69	1. 80	. 60
Speeder (second process): Hank roving.....						2. 00
Spinning:						
Revolutions per minute, front roll.....		143	140	149	132	143
Twist multiplier.....		4. 75	4. 75	4. 50	4. 75	4. 40
Quantity per spindle week ³	Pound.....	1. 58	1. 56	1. 65	1. 49	1. 55
		20s warp yarn		30s warp yarn		
		Mill N	Model mill	Mill D	Mill K	Model mill
Cotton used:						
Grade ¹		SLM +	M	M—	M—	M
Staple length ²	Inch.....	1½+	1½	1½	1½+	1½
Picker lap.....	Ounce.....	14	14	13. 50	14	14
Quantity per picker week ³	Pound.....	10, 165	9, 350	14, 552	7, 276	11, 100
Card sliver.....	Grain.....	55	55	53	60	55
Quantity per card week ³	Pound.....	363	368	347	235	368
Finisher drawing sliver.....	Grain.....	55	55	53	60	55
Quantity per finisher delivery week ³	Pound.....	727	575	578	627	570
Slubber (first process): Hank roving.....		2. 40	2. 00	1. 69	1. 10	3. 00
Speeder (second process): Hank roving.....					3. 50	
Spinning:						
Revolutions per minute, front roll.....		141	142	129	126	127
Twist multiplier.....		4. 35	4. 50	4. 50	4. 40	4. 50
Quantity per spindle week ³	Pound.....	1. 55	1. 66	. 98	. 93	1. 00

¹ Plus (+) indicates slightly higher grade and (—) slightly lower grade.

² Plus (+) indicates slightly longer staple.

³ Week of 40 hours.

Of the mills surveyed that produce 20s yarn, only one uses a fly frame package equal to or exceeding that of the package indicated for the Model mill. The specifications for the Model mill contemplate using one process of fly frames. Four of the mills spinning 20s yarn use one process of fly frames, but the package size is considerably smaller than that specified for the Model mill. Six of these mills use two processes of fly frames; this puts them at a considerable disadvantage.

The specifications for Model mills for the manufacture of 30s yarn call for the use of one process of fly frames and one of the mills surveyed was using identical equipment but it was making a much finer roving than that indicated for the Model mill and that adds considerably to the costs. With the exception of this one mill, all that were making 30s yarns were using two processes of fly frames.

From an operating standpoint, the quantity of yarn produced per man-hour in the mills surveyed could be increased and labor costs could be reduced considerably by the adoption of machinery that would permit them to make larger packages.

COST OF YARNS PRODUCED

It is apparent from the information presented that, considering the plants as a whole, none of the 15 mills equaled the Model mills in buildings, machinery, or lay-out, or in simplicity of operations, although some of the mills approximate the specifications in some particulars. These differences are reflected in differences in costs for the yarns produced. Results obtained by comparisons of differences in costs among the 15 mills, and between these mills and those indicated for Model mills, and information showing the factors responsible for the differences, should supply a basis for indicating the most effective means of improvement.

In making these comparisons it should be realized that wage rates vary considerably among these mills, that simple average occupational wage rates for each of the groups of mills producing the yarn count specified for Model mills were used in calculating labor costs for Model mills, and that some differences in over-all wage rates for Model mills from the average for the mills surveyed are accounted for by differences in proportions of the workers in each department along with differences in the wage rates for these workers (table 26).

The mills surveyed were operated at various degrees of capacity, ranging from a minimum of a little more than one shift of 40 hours a week to a maximum of three shifts of 40 hours each or a total of 120 hours a week. Costs for these mills were adjusted to a two-shift (80-hour) basis because it was thought that, on this basis, maximum benefits from comparisons would be obtained. Costs for Model mills are also shown for a two-shift (80-hour) basis. It is understood in this industry that manufacturing costs vary from period to period, and actual costs compiled from mill records have been adjusted to eliminate the influence of abnormal conditions.

Unit costs for mills that operate three shifts of 40 hours each per week normally would be lower, and those for mills operating one shift of 40 hours normally would be higher, than for mills that operate two shifts of 40 hours each. To adjust costs to the equivalent of

those for mills operating two shifts of 40 hours each, it is estimated that the unit cost for mills operating three shifts would need to be decreased 7 percent of total costs, and those for mills operating one shift of 40 hours would need to be increased 25 percent, exclusive of the costs of the cotton, and of social security and old-age benefit taxes, vacation pay, packing materials cost, freight cost, and selling expenses. A premium of 5 cents per hour for third-shift wages is included in this 7 percent lower unit costs estimate. Because of the higher depreciation costs the unit cost for three-shift operations in Model mills is estimated to be about 10 percent of processing costs; and for one-shift operations the unit cost is estimated to be about 30 percent of processing costs.

TABLE 26.—Average hourly wage rates for workers in 15 carded cotton-yarn manufacturing mills, by occupation and by kind of yarn produced, United States, May 1950¹

Item	Hosiery yarn			Warp yarn		
	10s	20s	30s	10s	20s	30s
Carding:	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Opener hand.....	0.998	0.972	0.985	0.974	0.947	0.950
Picker hand.....	1.008	.981	1.003	.983	.954	.972
Card hand.....	.997	.980	.997	.994	.950	.960
Card grinder.....	1.229	1.192	1.217	1.201	1.163	1.179
Section man.....	1.178	1.169	1.200	1.152	1.141	1.179
Drawing tender.....	1.027	1.017	1.039	1.030	.973	.945
Flyframe tender.....	1.123	1.133	1.142	1.120	1.110	1.071
Sweeper.....	.915	.903	.910	.888	.887	.915
Spinning:						
Section man.....	1.151	1.145	1.200	1.120	1.115	1.174
Oilier and bander.....	1.026	1.013	1.021	1.018	.983	1.033
Spinner.....	1.003	.986	1.015	1.001	.959	.978
Doffer.....	1.105	1.093	1.072	1.139	1.079	.988
Roving hauler.....	.955	.946	.957	.942	.927	.932
Sweeper.....	.915	.903	.910	.888	.887	.915
Winding:						
Section man.....	1.160	1.152	1.196	1.120	1.107	1.174
Winder tender.....	1.019	.980	.973	1.001	.945	.958
Bobbin and yarn man.....	.953	.942	.947	.942	.928	.932
Packing and shipping: Pack-						
er.....	1.010	.991	1.001	.984	.967	.962
Shop and outside:						
Mechanic.....	1.330	1.415	1.453	1.296	1.262	1.170
Shop helper.....	.943	.941	.960	.930	.934	1.010
Yardman.....	.903	.883	.917	.902	.880	.905
Watchman.....	.945	.922	.943	.924	.908	.940
All:						
Straight average.....	1.056	1.039	1.049	1.049	1.011	.996
Weighted average.....	1.062	1.052	1.067	1.061	1.037	1.042

¹ 10 mills produced 10s hosiery yarns, 11 produced 20s hosiery yarn, 5 produced 30s hosiery yarn, 5 produced 10s warp yarn, 6 produced 20s warp yarn, and 2 produced 30s warp yarn. For all mills combined, the straight average wage rate was \$1.0372 and the weighted average \$1.0527.

Some of the mills included in this survey make ply yarns, but the costs for single yarns given for these mills relate only to those processes which apply to this type of yarn. Yarn costs here given are for yarn on "cones."

Discounts, claim allowances, and selling expenses are not included in the cost data for the mills surveyed or for Model mills. The costs of these items vary with the selling prices of the yarns. Discounts and claim allowances are usually deducted from the gross selling prices to arrive at net selling prices. Selling expenses for the mills surveyed averaged 2.68 percent of sales for 10s hosiery, 2.57 percent for 10s warp, 2.98 percent for 20s hosiery, 2.97 percent for 20s warp, 3.19 percent for 30s hosiery, and 2.50 percent for 30s warp yarns. Terms for the selling prices of yarn usually allow 2-percent discounts if payment is made on or before the 10th of the following month.

Results for the 15 mills show that total costs to manufacturers ranged from 52.03 cents per pound to 55.75 cents and averaged 53.28 cents for 10s hosiery yarns, compared with 50.06 cents for the Model mill; from 57.30 cents to 62.46 cents and averaged 58.74 cents for 20s hosiery yarns, compared with 55.97 cents for the Model mill; and from 61.14 cents to 66.13 cents and averaged 63.56 cents for 30s hosiery yarns, compared with 61.29 cents for the Model mill. Costs for warp yarns were about the same as those for hosiery yarns (table 27).

Total costs include net cotton costs; processing costs, representing total labor and overhead costs; and other expenses, including social security and old-age benefit taxes, vacation pay, packing materials, and freight. But they do not include selling expenses which ranged from about 1.5 percent to 5 percent and averaged about 3 percent of sales (table 28).

TABLE 27.—Average cost per pound to manufacturers of specified kinds of carded cotton yarns, by specified mills, United States, May 1950 ¹

Mill	Total cost ²	Net cot- ton cost ³	Manufacturing cost			
			Total	Labor ⁴	Over- head	Other ⁵
	10s hosiery yarn					
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
B-----	55. 75	40. 15	15. 60	9. 76	3. 67	2. 17
F-----	53. 24	38. 64	14. 60	8. 52	4. 06	2. 02
H-----	52. 68	36. 88	15. 80	8. 24	4. 78	2. 78
J-----	52. 03	39. 15	12. 88	7. 52	2. 87	2. 49
K-----	52. 73	38. 62	14. 11	8. 02	3. 66	2. 43
N-----	52. 79	38. 45	14. 34	7. 50	4. 34	2. 50
R-----	52. 62	38. 24	14. 38	9. 01	2. 83	2. 54
S-----	53. 09	36. 21	16. 88	11. 00	3. 36	2. 52
T-----	54. 96	37. 18	17. 78	11. 37	3. 78	2. 63
V-----	52. 96	38. 75	14. 21	7. 59	3. 83	2. 79
Average ⁶ -----	53. 28	38. 23	15. 05	8. 85	3. 72	2. 48
Model-----	50. 06	39. 52	10. 54	4. 50	3. 78	2. 26

See footnotes at end of table.

TABLE 27.—Average cost per pound to manufacturers of specified kinds of carded yarns, by specified mills, United States, May 1950¹—Con.

Mill	Total cost ²	Net cotton cost ³	Manufacturing cost			
			Total	Labor ⁴	Over-head	Other ⁵
	20s hosiery yarn					
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
B-----	60. 33	40. 15	20. 18	12. 71	5. 23	2. 24
F-----	57. 89	38. 64	19. 25	11. 22	5. 90	2. 13
H-----	59. 17	36. 88	22. 29	11. 97	7. 31	3. 01
I-----	57. 51	37. 19	20. 32	10. 44	7. 44	2. 44
J-----	57. 30	39. 15	18. 15	11. 27	4. 19	2. 69
K-----	57. 99	38. 62	19. 37	11. 28	5. 51	2. 58
N-----	59. 17	38. 45	20. 72	11. 27	6. 73	2. 72
O-----	57. 45	38. 85	18. 60	10. 22	6. 15	2. 23
R-----	57. 63	38. 24	19. 39	12. 45	4. 24	2. 70
T-----	59. 22	37. 18	22. 04	14. 01	5. 30	2. 73
U-----	62. 46	39. 94	22. 52	12. 97	6. 67	2. 88
Average ⁶ -----	58. 74	38. 48	20. 26	11. 80	5. 88	2. 58
Model-----	55. 97	39. 92	16. 05	7. 05	6. 64	2. 36
	30s hosiery yarn					
I-----	61. 14	37. 19	23. 95	12. 29	9. 18	2. 48
J-----	63. 41	39. 15	24. 26	15. 22	6. 14	2. 90
K-----	63. 66	38. 62	25. 04	14. 81	7. 50	2. 73
O-----	63. 48	38. 85	24. 63	14. 06	8. 26	2. 31
U-----	66. 13	39. 94	26. 19	14. 94	8. 27	2. 98
Average ⁶ -----	63. 56	38. 75	24. 81	14. 26	7. 87	2. 68
Model-----	61. 29	40. 25	21. 04	9. 44	9. 14	2. 46
	10s warp yarn					
B-----	56. 02	40. 15	15. 87	9. 90	3. 79	2. 18
H-----	52. 84	36. 88	15. 96	8. 23	4. 95	2. 78
K-----	52. 74	38. 62	14. 12	7. 98	3. 71	2. 43
N-----	52. 73	38. 45	14. 28	7. 45	4. 34	2. 49
S-----	53. 60	36. 21	17. 39	11. 34	3. 51	2. 54
Average ⁶ -----	53. 58	38. 06	15. 52	8. 98	4. 06	2. 48
Model-----	50. 19	39. 52	10. 67	4. 46	3. 95	2. 26

See footnotes at end of table.

TABLE 27.—Average cost per pound to manufacturers of specified kinds of carded yarns, by specified mills, United States, May 1950 ¹—Con.

Mill	Total cost ²	Net cot- ton cost ³	Manufacturing cost			
			Total	Labor ⁴	Over- head	Other ⁵
20s warp yarn						
B-----	Cents 60. 92	Cents 40. 15	Cents 20. 77	Cents 13. 11	Cents 5. 41	Cents 2. 25
C-----	55. 52	37. 69	17. 83	10. 43	5. 29	2. 11
D-----	56. 26	38. 99	17. 27	9. 01	6. 36	1. 90
H-----	60. 30	36. 88	23. 42	12. 45	7. 94	3. 03
K-----	57. 94	38. 62	19. 32	11. 15	5. 60	2. 57
N-----	59. 65	38. 45	21. 20	11. 53	6. 94	2. 73
Average ⁶ -----	58. 43	38. 46	19. 97	11. 28	6. 26	2. 43
Model-----	56. 27	39. 92	16. 35	7. 09	6. 90	2. 36
30s warp yarn						
D-----	61. 02	38. 99	22. 03	11. 53	8. 54	1. 96
K-----	64. 27	38. 62	25. 65	15. 09	7. 81	2. 75
Average ⁶ -----	62. 64	38. 80	23. 84	13. 31	8. 17	2. 36
Model-----	62. 03	40. 25	21. 78	9. 49	9. 83	2. 46

¹ Data are for 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of carded cotton-yarn mill operations.

² Selling expenses are not included. These expenses averaged 2.68 percent of sales for 10s hosiery yarn, 2.98 percent for 20s hosiery yarn, 3.19 percent for 30s hosiery yarn, 2.57 percent for 10s warp yarn, 2.97 percent for 20s warp yarn, and 2.50 percent for 30s warp yarn.

³ Cotton costs adjusted for waste sold. See table 20 for information on grade and staple length of the cotton used. Gross waste (percent of cotton opened) averaged 13.43 percent for 10s hosiery yarn, 13.40 percent for 20s hosiery and 30s hosiery yarns, 14.19 percent for 10s warp yarn, 14.73 percent for 20s warp yarn, and 15.99 percent for 30s warp yarn. Net waste (after credit for value of waste) averaged 10.03 percent for 10s hosiery yarn, 9.85 percent for 20s hosiery yarn, 9.64 percent for 30s hosiery yarn, 11 percent for 10s warp yarn, 11.23 percent for 20s warp yarn, and 12.25 percent for 30s warp yarn. For Model mills a gross waste of 14 percent and a net waste of 10.8 percent were used.

⁴ Includes all labor on payroll except superintendence which is included in overhead costs.

⁵ Includes costs of social security and old-age benefits, vacation pay, packing materials, and freight.

⁶ Straight or simple average.

TABLE 28.—*Average selling expenses as a percentage of sales of carded cotton yarn, by mills, United States, May 1950*

Mill	Selling expenses as a percentage of sales	Mill	Selling expenses as a percentage of sales
	<i>Percent</i>		<i>Percent</i>
B-----	3.50	O-----	3.00
C-----	5.00	R-----	5.00
D-----	2.00	S-----	2.00
F-----	2.00	T-----	2.00
H-----	1.58	U-----	2.75
I-----	5.00	V-----	2.75
J-----	2.19		
K-----	3.00	Average-----	2.97
N-----	2.76		

Total costs to manufacturers for the mills surveyed averaged about 6.4 percent higher than those indicated for the Model mill for 10s hosiery yarn, 4.9 percent higher for 20s hosiery yarn, and 3.7 percent higher for 30s hosiery yarn. The average difference for 10s warp yarn was somewhat greater and those for 20s and 30s warp yarns were less than those indicated for hosiery yarns (table 27). Costs per pound of yarn for the mills that had the highest costs exceeded those indicated for Model mills by more than 11 percent for 10s hosiery, 10s warp, and 20s hosiery yarns; by about 8 percent for 20s warp and 30s hosiery yarns; and by 3.6 percent for 30s warp yarns.

Total costs per pound of 10s hosiery, 10s warp, and 20s hosiery yarns for the mills of lowest costs exceeded by considerable margins those indicated for Model mills. Total costs for these mills for 20s warp, 30s hosiery, and 30s warp yarns, however, were lower than those indicated for Model mills, but differences between average wage rates for these mills of low costs and those indicated for Model mills were more than enough to account for the differences in total costs shown. In addition, the yarns turned out by some of these mills were relatively low in quality.

NET COTTON COSTS

Net cotton costs, for the purposes of this study, include the cost of cotton in the bale delivered to the mills and credited with the sale of waste material at the prevailing market price for waste. Prices of cotton used are based on the official quotations for cotton "landed group B mill points" on March 30, 1950. Differences in prices of cotton for the different mills reflect differences in grade and staple length. Differences in net cotton costs reflect these differences in grade and staple length adjusted for waste sold, based on cotton prices as of March 30, 1950.

Data for the 15 mills show that net cotton costs per pound of yarn, adjusted to eliminate the influences of differences in time and location,

ranged from 36.21 cents to 40.15 cents and averaged 38.23 cents for 10s hosiery yarns, compared with 39.52 cents for the Model mill; from 36.88 cents to 40.15 cents and averaged 38.48 cents for 20s hosiery yarns, compared with 39.92 cents for the Model mill; and from 37.19 cents to 39.94 cents and averaged 38.75 cents for 30s hosiery yarns, compared with 40.25 cents for the Model mill. The costs for warp yarns were about the same as those for hosiery yarns of the same numbers (table 27).

The proportion of total costs to manufacturers, for the 15 mills, that were accounted for by net cotton costs, ranged from 68.2 percent to 75.2 percent and averaged 71.8 percent for 10s hosiery yarns, compared with 78.9 percent for the Model mill; from 62.3 percent to 68.3 percent and averaged 65.5 percent for 20s hosiery yarns, compared with 71.3 percent for the Model mill; and from 60.4 percent to 61.7 percent and averaged 61 percent for 30s hosiery yarns, compared with 65.7 percent for the model mill.

As the cotton indicated for Model mills was selected with a view to securing the lowest total cost of the yarns, while maintaining reasonable quality of the products, the differences between net cotton costs for the mills surveyed and those indicated for Model mills are expected to be more than offset by differences in other costs as a result of using the cotton of higher quality. Some of these mills apparently could increase their efficiency and reduce their total cost per pound of yarn by adopting a little better quality of cotton as standard, and adjusting their drafts, speeds, and machine assignments for higher rates of production. Although the problems of learning the grade and staple length of cotton that is relatively best adapted to the production of specific kinds of yarns are rather elusive, it is believed that carded-yarn mills as a whole could reduce their total unit costs by a moderate amount through better adjustments in the grade and staple length of the cotton they use.

The actual waste made in manufacturing carded yarns is considered reasonable. There may be some opportunities for small reductions but hardly for large savings.

MANUFACTURING COSTS

Manufacturing costs as given in this section of the bulletin include labor, overhead, and other costs such as social security and old-age benefit taxes, vacation pay, packing materials, and freight for the delivery of yarn to the purchaser, but they do not include net cotton cost and selling expenses. Data assembled for the 15 mills show that manufacturing costs per pound of carded cotton yarns ranged from 12.88 cents to 17.78 cents and averaged 15.05 cents for 10s hosiery yarns, compared with 10.54 cents for the Model mill; from 18.15 cents to 22.52 cents and averaged 20.26 cents for 20s hosiery yarns, compared with 16.05 cents for the Model mill; and from 23.95 cents to 26.19 cents and averaged 24.81 cents for 30s hosiery yarns, compared with 21.04 cents for the Model mill. Costs for warp yarns are about the same as those for hosiery yarns of the same numbers (table 27).

Manufacturing costs for the 15 mills ranged from 22 percent to more than 68 percent and averaged about 42 percent greater than those indicated for the Model mill, for 10s hosiery yarn; from 13 percent to 40 percent and averaged 26 percent greater than those for the Model mill, for 20s hosiery yarn; and from 14 percent to 24 percent and averaged 18 percent above those for the Model mill, for 30s hosiery yarn. Differences for warp yarns ranged from about the same as those indicated for hosiery yarns to somewhat less than these differences.

These differences in manufacturing costs are offset to some extent by differences in net cotton costs. But after adjustments are made in total manufacturing costs by subtracting from these costs, for the mills surveyed, the differences between the net cotton costs to these mills and those indicated for Model mills, the adjusted manufacturing costs for the mills surveyed averaged 30 percent greater for 10s hosiery yarn, 17 percent greater for 20s hosiery yarn and 11 percent greater for 30s hosiery yarn than the costs indicated for the Model mills. It is apparent that very substantial savings in costs would result from putting into effect the conditions indicated by the specifications for Model mills.

The proportions of total mill costs accounted for by manufacturing costs ranged from 24.8 percent to 32.4 percent and averaged 28.2 percent for 10s hosiery yarns, compared with 21.1 percent for the Model mill; from 31.7 percent to 37.7 percent and averaged 34.5 percent for 20s hosiery yarns, compared with 28.7 percent for the Model mill; and from 38.3 percent to 39.6 percent and averaged 39 percent for 30s hosiery yarns, compared with 34.3 percent for the Model mill.

Differences in size of the mills normally would be expected to affect manufacturing costs. Theoretically, cost per unit for the medium-sized or larger plants would be expected to be lower than those for the small plants. But the influences of such factors as differences in ability and efforts of managers, in variety and quality of yarns spun, and in kinds and amounts of machinery used, are apparently such that costs vary somewhat irregularly with the size of the plant. Data for the 15 mills show that manufacturing costs, for plants spinning 12 or fewer counts of yarn, averaged substantially less for mills with 7,000 to 14,000 spindles than for mills with less than 7,000 spindles (table 29). Costs for mills spinning 4 through 12 counts, and with 7,000 to 14,000 spindles averaged more for 10s yarns and less for 20s and 30s yarns than those for mills with 14,000 to 25,000 spindles. Costs for mills spinning more than 12 counts, and with 14,000 to 25,000 spindles averaged consistently and substantially lower than those for mills with smaller numbers of spindles.

These differences in manufacturing costs also may be influenced by differences in the quality of the cotton used, but comparisons of total costs of yarns to manufacturers, including net cotton costs and manufacturing costs, show results similar in most respects to those indicated by manufacturing costs. Although only a small number of mills was included in the study and factors other than size of mill and number of counts spun are also important considerations, these

results appear to indicate that carded cotton-yarn mills that have less than 7,000 spindles usually are too small for the most efficient operation, even for the manufacture of only a few counts of yarn; that mills with 7,000 to 14,000 spindles may be large enough for efficient operation, if the number of counts spun is small; and that, if 12 or more counts are spun, the size of mills usually would need to exceed 14,000 spindles if the most efficient operation is to be expected.

TABLE 29.—*Average manufacturing costs per pound of specified kinds of carded cotton yarn, by number of counts spun and by size of mill, United States, May 1950¹*

Kind of yarn	Size of mill		
	Less than 7,000 spindles	7,000 to 14,000 spindles	14,000 to 25,000 spindles
Mills spinning 1 through 3 counts			
20s yarn-----	<i>Cents</i> ² (3) 19. 41	<i>Cents</i> (1) 17. 83	<i>Cents</i> -----
Mills spinning 4 through 12 counts			
10s yarn-----	(3) 17. 35	(3) 14. 40	(1) 12. 88
20s yarn-----	(1) 22. 04	(4) 19. 39	(2) 20. 34
30s yarn-----	-----	(2) 24. 29	(2) 25. 22
Mills spinning more than 12 counts			
10s yarn-----	-----	(4) 15. 10	(2) 14. 12
20s yarn-----	-----	(4) 21. 91	(2) 19. 34

¹ The data are for 15 representative mills. The costs do not include net cotton costs.

² Numbers in parentheses refer to the number of mills included in the average.

It is generally recognized that variety of counts spun and frequency of changing products (that is rovings or counts if yarn) contribute to relatively high manufacturing costs. Data given earlier in this bulletin show a wide range in number of counts of yarn spun by the 15 mills studied. Results of analysis of data for these mills show that average manufacturing costs per pound of yarn, for small and medium-sized mills, vary directly and substantially with the number of counts spun (table 30). For the larger mills, average manufacturing costs vary somewhat irregularly with number of counts spun. These results appear to indicate that considerable reductions in processing costs would result from confining the operations, particularly of the small and medium-sized mills, to the manufacture of only a few counts of yarn.

Labor and overhead costs by departments, which accounts for most of manufacturing costs, show wide variations among the mills surveyed and from one yarn to another (tables 31, 32 and 33). For 10s hosiery and 20s hosiery yarns, costs per pound for handling and storage, for opening and picking, for drawing, and for fly frames, were more than twice as large for some mills as for others. Total roving costs, which account on the average for more than one-third of total labor and overhead costs, were more than 50 percent higher in some mills than in others. For the mills of highest costs, spinning costs for 20s hosiery yarn, for example, which account on the average for more than 40 percent of total labor and overhead costs, were about 45 percent higher than those for the mill of lowest cost. Winding costs, which on the average account for about 21 percent of total labor and overhead costs for 10s hosiery yarns, for the mill of highest cost were more than 90 percent higher than those for the mill of lowest cost.

TABLE 30.—Average manufacturing costs per pound of specified kinds of carded cotton yarn, by number of counts spun and by size of mill, United States, May 1950¹

Kind of yarn	Number of counts spun		
	1 through 3	4 through 12	More than 12
Mills with less than 7,000 spindles			
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
10s yarn-----	² (2) 15. 74	(3) 17. 35	-----
20s yarn-----	(3) 19. 41	(1) 22. 04	-----
Mills with 7,000 to 14,000 spindles			
10s yarn-----	-----	(3) 14. 40	(4) 15. 10
20s yarn-----	(1) 17. 83	(4) 19. 39	(4) 21. 93
Mills with 14,000 to 25,000 spindles			
10s yarn-----	-----	(1) 12. 88	(2) 14. 12
20s yarn-----	-----	(2) 20. 34	(2) 19. 34
30s yarn-----	-----	(2) 25. 22	(2) 25. 34

¹ The data are for 15 representative mills. The costs do not include net cotton costs.

² Numbers in parentheses refer to the number of mills included in the average.

TABLE 31.—Average overhead and labor costs per pound for 10s hosiery carded cotton yarn, by mills and by departments, United States, May 1950 ¹

Department and item of cost	Mill											
	B	F	H	J	K	N	R	S	T	V	Av.	Model
Roving:												
Handling and storage:												
Overhead-----	Cents 0. 10	Cents 0. 07	Cents 0. 24	Cents 0. 06	Cents 0. 10	Cents 0. 13	Cents 0. 06	Cents 0. 06	Cents 0. 04	Cents 0. 05	Cents 0. 09	Cents 0. 06
Labor-----	. 24	. 14	. 52	. 50	. 34	. 36	. 34	. 25	. 21	. 20	. 31	. 17
Total-----	. 34	. 21	. 76	. 56	. 44	. 49	. 40	. 31	. 25	. 25	. 40	. 23
Opening: and picking:												
Overhead-----	. 44	. 40	. 46	. 27	. 50	. 36	. 29	. 30	. 38	. 34	. 37	. 37
Labor-----	. 79	. 43	. 41	. 29	. 49	. 26	. 41	. 54	. 34	. 41	. 44	. 24
Total-----	1. 23	. 83	. 87	. 56	. 99	. 62	. 70	. 84	. 72	. 75	. 81	. 61
Carding:												
Overhead-----	. 76	. 93	1. 13	. 67	. 90	. 97	. 73	. 75	. 84	. 79	. 85	1. 17
Labor-----	1. 30.	. 99	1. 07	. 93	1. 04	. 81	1. 06	1. 23	1. 07	. 87	1. 04	. 62
Total-----	2. 06	1. 92	2. 20	1. 60	1. 94	1. 78	1. 79	1. 98	1. 91	1. 66	1. 89	1. 79
Drawing:												
Overhead-----	. 33	. 30	. 32	. 19	. 22	. 24	. 18	. 29	. 28	. 22	. 26	. 29
Labor-----	. 67	. 48	. 41	. 44	. 46	. 39	. 35	. 97	. 78	. 36	. 53	. 37
Total-----	1. 00	. 78	. 73	. 63	. 68	. 63	. 53	1. 26	1. 06	. 58	. 79	. 66

CARDED COTTON YARN AND MEANS OF IMPROVEMENT												
Fly frames:												
Overhead-----	. 35	. 60	. 47	. 28	. 54	. 49	. 38	. 18	. 62	. 62	. 45	. 26
Labor-----	1. 10	1. 57	. 85	. 95	1. 26	. 94	1. 44	. 59	2. 29	1. 06	1. 21	. 43
Total-----	1. 45	2. 17	1. 32	1. 23	1. 80	1. 43	1. 82	. 77	2. 91	1. 68	1. 66	. 69
Total roving cost:												
Overhead-----	1. 98	2. 30	2. 62	1. 47	2. 26	2. 19	1. 64	1. 58	2. 16	2. 02	2. 02	2. 15
Labor-----	4. 10	3. 61	3. 26	3. 11	3. 59	2. 76	3. 60	3. 58	4. 69	2. 90	3. 52	1. 83
Total-----	6. 08	5. 91	5. 88	4. 58	5. 85	4. 95	5. 24	5. 16	6. 85	4. 92	5. 54	3. 98
Spinning:												
Overhead-----	. 95	1. 08	1. 52	1. 01	1. 05	1. 42	. 80	1. 17	1. 10	1. 48	1. 16	1. 29
Labor-----	2. 72	2. 57	2. 62	2. 41	2. 47	2. 62	2. 53	3. 60	3. 77	2. 45	2. 78	1. 40
Total-----	3. 67	3. 65	4. 14	3. 42	3. 52	4. 04	3. 33	4. 77	4. 87	3. 93	3. 94	2. 69
Winding:												
Overhead-----	. 65	. 63	. 46	. 35	. 29	. 59	. 33	. 52	. 47	. 28	. 46	. 28
Labor-----	2. 55	2. 18	1. 91	1. 73	1. 66	1. 69	2. 59	3. 33	2. 63	2. 02	2. 23	1. 10
Total-----	3. 20	2. 81	2. 37	2. 08	1. 95	2. 28	2. 92	3. 85	3. 10	2. 30	2. 69	1. 38
Packing and shipping:												
Overhead-----	. 09	. 05	. 18	. 04	. 06	. 14	. 06	. 09	. 05	. 05	. 08	. 06
Labor-----	. 39	. 16	. 45	. 27	. 30	. 43	. 29	. 49	. 28	. 22	. 33	. 17
Total-----	. 48	. 21	. 63	. 31	. 36	. 57	. 35	. 58	. 33	. 27	. 41	. 23
Total cost:												
Overhead-----	3. 67	4. 06	4. 78	2. 87	3. 66	4. 34	2. 83	3. 36	3. 78	3. 83	3. 72	3. 78
Labor-----	9. 76	8. 52	8. 24	7. 52	8. 02	7. 50	9. 01	11. 00	11. 37	7. 59	8. 85	4. 50
Total-----	13. 43	12. 58	13. 02	10. 39	11. 68	11. 84	11. 84	14. 36	15. 15	11. 42	12. 57	8. 28

¹ Data are from a survey of 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

TABLE 32.—Average overhead and labor costs per pound for 20s hosiery carded cotton yarn, by mills and by departments, United States, May 1950 ¹

Department and item of cost	Mill												
	B	F	H	I	J	K	N	O	R	T	U	Av.	Model
Roving:													
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 10	0. 07	0. 24	0. 16	0. 06	0. 10	0. 13	0. 15	0. 06	0. 04	0. 06	0. 11	0. 09
Labor-----	. 24	. 14	. 52	. 31	. 50	. 34	. 36	. 32	. 34	. 21	. 22	. 32	. 21
Total-----	. 34	. 21	. 76	. 47	. 56	. 44	. 49	. 47	. 40	. 25	. 28	. 43	. 30
Opening and picking:													
Overhead-----	. 44	. 40	. 46	. 52	. 27	. 50	. 36	. 54	. 29	. 38	. 27	. 40	. 51
Labor-----	. 79	. 43	. 41	. 35	. 29	. 49	. 26	. 55	. 41	. 34	. 16	. 41	. 36
Total-----	1. 23	. 83	. 87	. 87	. 56	. 99	. 62	1. 09	. 70	. 72	. 43	. 81	. 87
Carding:													
Overhead-----	. 76	. 93	1. 13	1. 33	. 67	. 90	. 97	1. 33	. 73	. 84	1. 20	. 98	1. 25
Labor-----	1. 30	. 99	1. 07	1. 05	. 93	1. 04	. 81	1. 16	1. 06	1. 07	1. 11	1. 05	. 76
Total-----	2. 06	1. 92	2. 20	2. 38	1. 60	1. 94	1. 78	2. 49	1. 79	1. 91	2. 31	2. 03	2. 01
Drawing:													
Overhead-----	. 33	. 30	. 32	. 28	. 19	. 22	. 24	. 30	. 18	. 28	. 27	. 26	. 32
Labor-----	. 67	. 48	. 41	. 38	. 44	. 46	. 39	. 53	. 35	. 78	. 31	. 47	. 33
Total-----	1. 00	. 78	. 73	. 66	. 63	. 68	. 63	. 83	. 53	1. 06	. 58	. 73	. 65

Fly frames:													
Overhead-----	. 73	. 75	. 66	1. 36	. 58	. 71	. 79	. 54	. 38	. 70	1. 45	. 79	. 59
Labor-----	1. 94	1. 96	1. 18	2. 54	1. 47	1. 45	1. 33	1. 21	1. 44	2. 56	3. 07	1. 83	. 74
Total-----	2. 67	2. 71	1. 84	3. 90	2. 05	2. 16	2. 12	1. 75	1. 82	3. 26	4. 52	2. 62	1. 33
Total roving cost:													
Overhead-----	2. 36	2. 45	2. 81	3. 65	1. 77	2. 43	2. 49	2. 86	1. 64	2. 24	3. 25	2. 54	2. 76
Labor-----	4. 94	4. 00	3. 59	4. 63	3. 63	3. 78	3. 15	3. 77	3. 60	4. 96	4. 87	4. 08	2. 40
Total-----	7. 30	6. 45	6. 40	8. 28	5. 40	6. 21	5. 64	6. 63	5. 24	7. 20	8. 12	6. 62	5. 16
Spinning:													
Overhead-----	2. 13	2. 55	3. 45	2. 84	1. 92	2. 36	3. 34	2. 55	2. 10	2. 54	2. 55	2. 58	3. 22
Labor-----	4. 83	4. 12	5. 35	3. 43	4. 18	4. 56	5. 50	3. 82	5. 08	6. 14	4. 36	4. 67	2. 88
Total-----	6. 96	6. 67	8. 80	6. 27	6. 10	6. 92	8. 84	6. 37	7. 18	8. 68	6. 91	7. 25	6. 10
Winding:													
Overhead-----	. 65	. 85	. 87	. 84	. 46	. 66	. 76	. 68	. 44	. 47	. 79	. 68	. 53
Labor-----	2. 55	2. 94	2. 58	2. 12	3. 19	2. 64	2. 19	2. 46	3. 48	2. 63	3. 43	2. 75	1. 57
Total-----	3. 20	3. 79	3. 45	2. 96	3. 65	3. 30	2. 95	3. 14	3. 92	3. 10	4. 22	3. 43	2. 10
Packing and shipping:													
Overhead-----	. 09	. 05	. 18	. 11	. 04	. 06	. 14	. 06	. 06	. 05	. 08	. 08	. 13
Labor-----	. 39	. 16	. 45	. 26	. 27	. 30	. 43	. 17	. 29	. 28	. 31	. 30	. 20
Total-----	. 48	. 21	. 63	. 37	. 31	. 36	. 57	. 23	. 35	. 33	. 39	. 38	. 33
Total cost:													
Overhead-----	5. 23	5. 90	7. 31	7. 44	4. 19	5. 51	6. 73	6. 15	4. 24	5. 30	6. 67	5. 88	6. 64
Labor-----	12. 71	11. 22	11. 97	10. 44	11. 27	11. 28	11. 27	10. 22	12. 45	14. 01	12. 97	11. 80	7. 05
Total-----	17. 94	17. 12	19. 28	17. 88	15. 46	16. 79	18. 00	16. 37	16. 69	19. 31	19. 64	17. 68	13. 69

¹ Data are from a survey of 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

TABLE 33.—Average overhead and labor costs per pound for 30s hosiery carded cotton yarn, by mills and by departments, United States, May 1950¹

Department and item of cost	Mill						
	I	J	K	O	U	Av.	Model
Roving:							
Handling and storage:							
Overhead.....	Cents 0. 16	Cents 0. 06	Cents 0. 10	Cents 0. 15	Cents 0. 06	Cents 0. 11	Cents 0. 08
Labor.....	. 31	. 50	. 34	. 32	. 22	. 34	. 18
Total.....	. 47	. 56	. 44	. 47	. 28	. 45	. 26
Opening and picking:							
Overhead.....	. 52	. 27	. 50	. 54	. 27	. 42	. 60
Labor.....	. 35	. 29	. 49	. 55	. 16	. 37	. 33
Total.....	. 87	. 56	. 99	1. 09	. 43	. 79	. 93
Carding:							
Overhead.....	1. 33	. 67	1. 05	1. 33	1. 20	1. 12	1. 30
Labor.....	1. 05	. 93	1. 23	1. 16	1. 11	1. 10	. 89
Total.....	2. 38	1. 60	2. 28	2. 49	2. 31	2. 22	2. 19
Drawing:							
Overhead.....	. 28	. 19	. 30	. 30	. 27	. 27	. 40
Labor.....	. 38	. 44	. 64	. 53	. 31	. 46	. 46
Total.....	. 66	. 63	. 94	. 83	. 58	. 73	. 86
Fly frames:							
Overhead.....	1. 36	. 80	. 96	1. 04	1. 45	1. 12	. 89
Labor.....	2. 54	2. 03	2. 44	2. 32	3. 07	2. 48	1. 06
Total.....	3. 90	2. 83	3. 40	3. 36	4. 52	3. 60	1. 95
Total roving costs:							
Overhead.....	3. 65	1. 99	2. 91	3. 36	3. 25	3. 03	3. 27
Labor.....	4. 63	4. 19	5. 14	4. 88	4. 87	4. 74	2. 92
Total.....	8. 28	6. 18	8. 05	8. 24	*8. 12	7. 77	6. 19
Spinning:							
Overhead.....	4. 44	3. 53	3. 71	4. 02	4. 06	3. 95	4. 84
Labor.....	4. 91	6. 73	6. 47	6. 02	5. 93	6. 01	4. 22
Total.....	9. 35	10. 26	10. 18	10. 04	9. 99	9. 96	9. 06

See footnote at end of table.

TABLE 33.—Average overhead and labor costs per pound for 30s hosiery carded cotton yarn, by mills and by departments, United States, May 1950¹—Continued

Department and item of cost	Mill						
	I	J	K	O	U	Av.	Model
Winding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 98	0. 58	0. 82	0. 82	0. 88	0. 82	0. 88
Labor.....	2. 49	4. 03	2. 90	2. 99	3. 83	3. 25	2. 09
Total.....	3. 47	4. 61	3. 72	3. 81	4. 71	4. 07	2. 97
Packing and shipping:							
Overhead.....	. 11	. 04	. 06	. 06	. 08	. 07	. 15
Labor.....	. 26	. 27	. 30	. 17	. 31	. 26	. 21
Total.....	. 37	. 31	. 36	. 23	. 39	. 33	. 36
Total cost:							
Overhead.....	9. 18	6. 14	7. 50	8. 26	8. 27	7. 87	9. 14
Labor.....	12. 29	15. 22	14. 81	14. 06	14. 94	14. 26	9. 44
Total.....	21. 47	21. 36	22. 31	22. 32	23. 21	22. 13	18. 58

¹ Data are from a survey of 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

These differences in costs reflect the influences of such factors as differences in size and organization of the plant, in kinds and condition of machinery and equipment used, in machine assignments and workloads, in quality of the cotton used, in the quality of the yarn produced, and in wage rates. It is apparent from the differences shown that if adjustments were made so that the costs for each department in each mill would approximate those for the operator who had the lowest costs for that department, reductions in total labor and overhead costs for 10s hosiery yarn would be about 12 percent for the mill of lowest costs, 40 percent for the mill of highest costs, and 27 percent on the average for all mills. The reductions in these costs for 20s hosiery yarn would be about 10 percent for the lowest cost mill, 30 percent for the highest cost mill, and 22 percent on the average for all mills. For 30s hosiery yarn, the reductions would be about 12 percent for the lowest cost mill, 19 percent for the highest cost mill, and 15 percent on the average for all mills. Somewhat similar results would be obtained for warp yarns.

Comparisons of labor and overhead costs for the mills surveyed with those indicated for Model mills, by departments, show possibilities for substantial improvements at each stage of the manufacturing procedure

(tables 31, 32, and 33). Costs by departments for the mills with highest costs exceeded the corresponding costs indicated for Model mills, for 10s hosiery yarns, by amounts ranging from 23 percent for carding to more than 100 percent for handling and storage, opening and picking, fly frames, and packing and shipping; for 20s hosiery yarns, by amounts ranging from 45 percent for spinning to more than 100 percent for handling and storage, fly frames, and winding; and for 30s hosiery, by amounts ranging from less than 10 percent for carding and packing and shipping to more than 100 percent for handling and storage and fly frames. These differences indicate possibilities of considerable improvement in most departments, particularly for the mills that now have the higher costs.

Average labor and overhead costs, by departments, for the 15 mills usually are substantially higher than those indicated for the Model mills. For 10s hosiery yarn, for example, average costs by departments for the mills surveyed exceeded those indicated for the Model mills by amounts ranging from about 6 percent for carding to 140 percent for fly frames. Total roving costs, which account for about 44 percent of total labor and overhead costs, averaged about 40 percent higher than those indicated for the Model mill. Spinning costs, which account for about 31 percent of total labor and overhead costs, average 46 percent higher, and winding costs, which account for about 21 percent of total labor and overhead costs, average about 95 percent higher, than those indicated for the Model mill. Differences between average labor and overhead costs by departments for the mills surveyed and those indicated for Model mills usually are larger for 10s hosiery yarn than for 20s and 30s hosiery yarns (tables 31, 32, and 33), but the differences shown for each count of yarn are usually large enough to indicate possibilities for substantial improvements.

The possibilities of bringing about reductions in the costs of labor and overhead for carded cotton yarns approximating the differences shown between costs for the mills surveyed and those indicated for Model mills would appear to depend, at least in part, upon whether the costs indicated for Model mills are attainable under actual operating conditions. Some support for the viewpoint that costs indicated for Model mills are not unreasonably low may be obtained from data on costs, by departments, showing that in many instances costs for some of the mills surveyed were as low as, or lower than, those indicated for Model mills (tables 34 and 35). Such relatively low costs for these mills are accounted for in most instances by differences in wage rates, in quality of the yarn produced, in depreciation costs, and in other factors discussed more in detail in connection with individual mill comparisons beginning on page 70. But after proper adjustments are made for differences in wage rates and in other factors, the costs for some of these mills approached closely enough those indicated for the Model mills to signify that Model mill costs are not unreasonable.

TABLE 34.—*Lowest departmental overhead and labor costs per pound for mills surveyed, Model mill, and difference, and average wage rate, for 10s, 20s, and 30s hosiery yarn, United States, May 1950*¹

Department and cost item	10s hosiery yarn			20s hosiery yarn			30s hosiery yarn		
	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference
Roving:									
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0.04	0.06	³ 0.02	0.04	0.09	³ 0.05	0.06	0.08	³ 0.02
Labor-----	.14	.17	³ .03	.14	.21	³ .07	.22	.18	.04
Opening and picking:									
Overhead-----	.27	.37	³ .10	.27	.51	³ .24	.27	.60	³ .33
Labor-----	.26	.24	.02	.16	.36	³ .20	.16	.33	³ .17
Carding:									
Overhead-----	.67	1.17	³ .50	.67	1.25	³ .58	.67	1.30	³ .63
Labor-----	.81	.62	.19	.81	.76	.05	.93	.89	.04
Drawing:									
Overhead-----	.18	.29	³ .11	.18	.32	³ .14	.19	.40	³ .21
Labor-----	.35	.37	³ .02	.31	.33	³ .02	.31	.46	³ .15
Fly frames:									
Overhead-----	.18	.26	³ .08	.38	.59	³ .21	.80	.89	³ .09
Labor-----	.59	.43	.16	1.18	.74	.44	2.03	1.06	.97
Total roving cost:									
Overhead-----	1.34	2.15	³ .81	1.54	2.76	³ 1.22	1.99	3.27	³ 1.28
Labor-----	2.15	1.83	.32	2.60	2.40	.20	3.65	2.92	.73
Spinning:									
Overhead-----	.80	1.29	³ .49	1.92	3.22	³ 1.30	3.53	4.84	³ 1.31
Labor-----	2.41	1.40	1.01	3.43	2.88	.55	4.91	4.22	.69

See footnote at end of table.

TABLE 34.—*Lowest departmental overhead and labor costs per pound for mills surveyed, Model mill, and difference, and average wage rate, for 10s, 20s, and 30s hosiery yarn, United States, May 1950*¹—Continued

Department and cost item	10s hosiery yarn			20s hosiery yarn			30s hosiery yarn		
	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference
Winding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 28	0. 28	0	0. 44	0. 53	³ 0. 09	0. 58	0. 88	³ 0. 30
Labor-----	1. 66	1. 10	. 56	2. 12	1. 57	. 55	2. 49	2. 09	. 40
Packing and shipping:									
Overhead-----	. 04	. 06	³ . 02	. 04	. 13	³ . 09	. 04	. 15	³ . 11
Labor-----	. 16	. 17	³ . 01	. 16	. 20	³ . 04	. 17	. 21	³ . 04
Total cost:									
Overhead-----	2. 46	3. 78	³ 1. 32	3. 94	6. 64	³ 2. 70	6. 14	9. 14	³ 3. 00
Labor-----	6. 38	4. 50	1. 88	8. 31	7. 05 ⁴	1. 26	11. 22	9. 44	1. 78
Grand total-----	8. 84	8. 28	. 56	12. 25	13. 69	³ 1. 44	17. 36 ⁴	18. 58	³ 1. 22
Average wage rate per hour-----	⁴ 106. 15	103. 84	2. 31	⁴ 101. 82	103. 76	³ 1. 94	⁴ 101. 81	105. 39	³ 3. 58

¹ All costs are adjusted to 2 shifts or 80 hours per week.² The lowest cost mill for overhead and labor for the particular department. The low mill for any particular department may not be low for another department, and a low mill for overhead may not be a low mill for labor in the same department.³ Cost for Model mill greater than cost for low-cost mill surveyed.⁴ Developed by first determining the ratio of low departmental costs to total and weighted by the plant average wage per hour.

TABLE 35.—*Lowest departmental overhead and labor costs per pound for mills surveyed, Model mill, and difference, and average wage rate, for 10s, 20s, and 30s warp yarn, United States, May 1950*¹

Department and cost item	10s warp yarn			20s warp yarn			30s warp yarn		
	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference
Roving:									
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0.06	0.06	0	0.09	0.09	0	0.09	0.09	0
Labor.....	.24	.17	.07	.24	.22	.02	.25	.19	.06
Opening and picking:									
Overhead.....	.30	.39	³ .09	.36	.53	³ .17	.45	.64	³ .19
Labor.....	.26	.25	.01	.26	.37	³ .11	.39	.36	.03
Carding:									
Overhead.....	.75	1.22	³ .47	.74	1.30	³ .56	.82	1.40	³ .58
Labor.....	.81	.64	.17	.81	.79	.02	.96	.95	.01
Drawing:									
Overhead.....	.22	.30	³ .08	.22	.33	³ .11	.22	.43	³ .21
Labor.....	.39	.33	.06	.39	.34	.05	.46	.49	³ .03
Fly frames:									
Overhead.....	.18	.27	³ .09	.47	.61	³ .14	.58	.96	³ .38
Labor.....	.59	.44	.15	.95	.77	.18	.95	1.14	³ .19
Total roving cost:									
Overhead.....	1.51	2.24	³ .73	1.88	2.86	³ .98	2.16	3.52	³ 1.36
Labor.....	2.29	1.83	.46	2.65	2.49	.16	3.01	3.13	³ .12
Spinning:									
Overhead.....	1.07	1.36	³ .29	2.31	3.35	³ 1.04	4.47	5.20	³ .73
Labor.....	2.48	1.45	1.03	3.34	2.99	.35	5.86	4.28	1.58

See footnote at end of table.

TABLE 35.—*Lowest departmental overhead and labor costs per pound for mills surveyed, Model mill, and difference, and average wage rate for 10s, 20s, and 30s warp yarn, United States, May 1950*¹—Continued

Department and cost item	10s warp yarn			20s warp yarn			30s warp yarn		
	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference	Low mill ²	Model mill	Difference
Winding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 24	0. 29	³ 0. 05	0. 51	0. 55	³ 0. 04	0. 68	0. 95	³ 0. 27
Labor.....	1. 38	1. 00	. 38	2. 06	1. 40	. 66	2. 17	1. 85	. 32
Packing and shipping:									
Overhead.....	. 06	. 06	0	. 06	. 14	³ . 08	. 06	. 16	³ . 10
Labor.....	. 30	. 18	. 12	. 22	. 21	. 01	. 22	. 23	³ . 01
Total cost:									
Overhead.....	2. 88	3. 95	³ 1. 07	4. 76	6. 90	³ 2. 14	7. 37	9. 83	³ 2. 46
Labor.....	6. 45	4. 46	1. 99	8. 27	7. 09	1. 18	11. 26	9. 49	1. 77
Grand total.....	9. 33	8. 41	. 92	13. 03	13. 99	³ . 96	18. 63	19. 32	³ . 69
Average wage rate per hour.....	⁴ 108. 07	103. 93	4. 14	⁴ 97. 98	104. 76	³ 6. 78	⁴ 94. 30	106. 02	³ 11. 72

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² The lowest cost mill for overhead and labor for the particular department. The low mill for any particular department may not be low for another department and a low mill for overhead may not be a low mill for labor in the same department.

³ Cost for Model mill greater than cost for low-cost mill surveyed.

⁴ Developed by first determining the ratio of low departmental costs to total and weighted by the plant average wage per hour.

LABOR COSTS

For the purposes of this study, and in line with general practices in the industry, labor costs include all labor paid through the plant payroll including overseers, repair shop workers, and outside labor. They do not include salaries paid to office and clerical workers. Labor costs accounted, on the average, for about 58 percent of total manufacturing costs for the 15 mills and 45 percent for Model mills.

Data for the 15 mills show that labor costs per pound of carded cotton yarn ranged from 7.50 cents to 11.37 cents and averaged 8.85 cents for 10s hosiery yarns, compared with 4.50 cents for the Model mill; from 10.22 cents to 14.01 cents and averaged 11.80 cents for 20s hosiery yarns, compared with 7.05 cents for the Model mill; and from 12.29 cents to 15.22 cents and averaged 14.26 cents for 30s hosiery yarns, compared with 9.44 cents for the Model mill (table 36).

The proportions of total costs of the yarn to manufacturers accounted for by labor costs ranged from 14.2 percent to 20.7 percent and averaged 16.6 percent for 10s hosiery yarns, compared with 9 percent for the Model mill; from 17.8 percent to 23.7 percent and averaged 20.1 percent for 20s hosiery yarns, compared with 12.6 percent for the Model mill; and from 20.1 percent to 24 percent and averaged 22.4 percent for 30s hosiery yarns, compared with 15.4 percent for the Model mill.

Labor costs for the 15 mills ranged from 67 percent to 153 percent, and averaged 97 percent higher than those for the Model mill, for 10s hosiery yarn; from 45 percent to 99 percent and averaged 67 percent higher than those for the Model mill, for 20s hosiery yarn; and from 30 percent to 61 percent, and averaged 51 percent higher than those for the Model mill, for 30s hosiery yarn. Differences for warp yarns are about the same as, to somewhat less than, those indicated for hosiery yarn (table 36).

These differences in labor costs are accounted for mainly by differences in production of yarn per man-hour, but differences in wage rates are large enough in some instances to be of considerable importance. Production of yarn per man-hour by the mills surveyed ranged from 41 percent to 66 percent and averaged 55 percent of that indicated for the Model mill, for 10s hosiery yarn; from 50 percent to 65 percent and averaged 61 percent of that for the Model mill, for 20s hosiery yarn; and from 60 percent to 71 percent and averaged 66 percent of that for the Model mill, for 30s hosiery yarn. An examination of the data in table 36 discloses that the differences for warp yarns are about the same as those indicated for hosiery yarns. These differences in quantity of yarn produced per hour of man labor may be accounted for by differences in size and organization of the plants; in kinds, amounts, and condition of the machinery and equipment used; in quality of cotton used and in quality and variety of products turned out; and in other factors referred to in this report.

TABLE 36.—Average production per man-hour, wage rate, and labor cost to manufacturers of carded cotton yarn, by mills and by kind of yarn, United States, May 1950 ¹

Mill	10s hosiery yarn		
	Production per man-hour	Average hourly wage rate	Average labor cost per pound
	Pounds	Dollars	Cents
B.....	9.56	0.9331	9.76
F.....	11.68	.9952	8.52
H.....	13.74	1.1325	8.24
J.....	14.39	1.0822	7.52
K.....	13.30	1.0667	8.02
N.....	13.79	1.0339	7.50
R.....	11.16	1.0059	9.01
S.....	9.81	1.0787	11.00
T.....	9.55	1.0856	11.37
V.....	15.16	1.1508	7.59
Average ²	12.73	1.0617	8.34
Model.....	23.08	1.0384	4.50
	20s hosiery yarn		
	Production per man-hour	Average hourly wage rate	Average labor cost per pound
	Pounds	Dollars	Cents
B.....	7.34	0.9331	12.71
F.....	8.87	.9952	11.22
H.....	9.46	1.1325	11.97
I.....	9.39	.9802	10.44
J.....	9.60	1.0822	11.27
K.....	9.46	1.0667	11.28
N.....	9.17	1.0339	11.27
O.....	9.28	.9486	10.22
R.....	8.08	1.0059	12.45
T.....	7.75	1.0856	14.01
U.....	9.00	1.1674	12.97
Average ²	8.99	1.0524	11.71
Model.....	14.72	1.0376	7.05
	30s hosiery yarn		
	Production per man-hour	Average hourly wage rate	Average labor cost per pound
	Pounds	Dollars	Cents
I.....	7.98	0.9802	12.29
J.....	7.11	1.0822	15.22
K.....	7.20	1.0667	14.81
O.....	6.75	.9486	14.06
U.....	7.81	1.1674	14.94
Average ²	7.33	1.0671	14.56
Model.....	11.16	1.0539	9.44

See footnote at end of table.

TABLE 36.—Average production per man-hour, wage rate, and labor cost to manufacturers of carded cotton yarn, by mills and by kind of yarn, United States, May 1950¹—Continued

Mill	10s warp yarn		
	Production per man-hour	Average hourly wage rate	Average labor cost per pound
	<i>Pounds</i>	<i>Dollars</i>	<i>Cents</i>
B.....	9. 43	0. 9331	9. 90
H.....	13. 76	1. 1325	8. 23
K.....	13. 37	1. 0667	7. 98
N.....	13. 88	1. 0339	7. 45
S.....	9. 51	1. 0787	11. 34
Average ²	12. 80	1. 0610	8. 29
Model.....	23. 30	1. 0393	4. 46
	20s warp yarn		
B.....	7. 12	0. 9331	13. 11
C.....	9. 33	. 9726	10. 43
D.....	10. 27	. 9251	9. 01
H.....	9. 10	1. 1325	12. 45
K.....	9. 57	1. 0667	11. 15
N.....	8. 97	1. 0339	11. 53
Average ²	9. 15	1. 0371	11. 33
Model.....	14. 78	1. 0476	7. 09
	30s warp yarn		
D.....	8. 02	0. 9251	11. 53
K.....	7. 07	1. 0667	15. 09
Average ²	7. 24	1. 0417	14. 39
Model.....	11. 17	1. 0602	9. 49

¹ Data are for 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

² Weighted average.

Wage rates paid by the mills surveyed varied considerably and the differences between average hourly wage rates for these mills and those used to calculate costs for Model mills are large enough in some instances to influence considerably the differences in average labor costs shown. For 10s hosiery yarns, average hourly wage rates for these

mills ranged from 10 percent below to 11 percent above those for the Model mill. Similar comparisons for 20s hosiery yarn show that the wage rates for the mills ranged from about 10 percent below to about 12 percent above those for Model mills. For 30s hosiery yarn, wage rates for these mills ranged from 10 percent below to 11 percent above those for the Model mill. An examination of the data in table 36 shows that the differences in wage rates for warp yarns range from about the same as those indicated for hosiery yarns to somewhat less than those for hosiery yarns.

Differences in production rates per man-hour, when related to differences in wage rates, show considerable irregularity (table 36). The influence of differences in quantity of yarn produced per unit of labor on differences in labor costs per pound of yarn, are offset in some instances and supplemented in others by differences in wage rates. Consequently, labor costs per pound of yarn vary irregularly, from one mill to another, with wage rates and with production per man-hour. Skilled laborers who are in a position to command higher wages normally would be expected to be more productive than less skilled labor, but such differences in production may be offset, in whole or in part, by such factors as differences in size, organization, and management of the plant; the kinds, amounts, and condition of the machinery used; and the quality of the cotton used and of the yarns produced.

Labor costs by departments show variations from one mill to another proportionally greater than those shown for total manufacturing costs (tables 31, 32, and 33). For 10s hosiery yarn, labor costs for handling and storage, opening and picking, drawing, and fly frames were each more than three times as high for some mills as for others. Total labor costs per pound of yarn for roving, which account on the average for almost 40 percent of total labor costs for 10s hosiery yarns, for the mill with highest costs were almost 70 percent larger than those for the mill with the lowest roving cost. For 20s hosiery yarn, labor costs for handling and storage and for opening and picking were more than three times as large, and those for drawing and fly frames were more than twice as large, for some mills as for others. Total roving costs per pound of yarn, which account on the average for more than one-third of total labor costs for 20s hosiery yarn, for the highest cost mill were 57 percent greater than those for the mill with the lowest roving cost.

Labor costs for spinning, which account on the average for about 31 percent of total labor costs for 10s hosiery yarn and almost 40 percent of the labor costs for 20s hosiery yarn, for the mills with highest costs were 56 percent and 79 percent, respectively, higher than those for mills with the lowest spinning costs. Labor costs for winding, which account on the average for about 25 percent and 23 percent, respectively, of the total costs for 10s hosiery and 20s hosiery yarns, for the highest cost mills were 100 percent and 64 percent, respectively, higher than those for mills with the lowest winding costs.

These differences emphasize the importance of making adjustments to increase efficiency and to reduce the cost of labor. If adjustments were made so that labor costs for each department in each mill approximated those for the lowest cost operator for that department, the total labor costs for 10s hosiery yarns would be reduced 15 percent for the lowest cost mill, about 44 percent for the highest cost

mill, and 28 percent on the average for all mills combined. For 20s hosiery yarns, such adjustments would reduce labor costs 18 percent for the lowest cost mill, 40 percent for the highest cost mill, and 29 percent on the average for all mills combined. Such adjustments probably would require the use of more new and improved machinery and equipment and the additional expenses involved might offset some of the saving in costs of labor.

Adjustments to approximate the conditions indicated for Model mills would result in even greater reductions in labor costs. These costs for the highest cost mills exceeded the corresponding costs indicated for Model mills by amounts ranging from 110 percent for carding to more than 200 percent for handling and storage, opening and picking, fly frames, and winding, for 10s hosiery yarn; from 71 percent for carding to more than 300 percent for fly frames, for 20s hosiery yarn; and from 38 percent for carding to about 190 percent for fly frames, for 30s hosiery yarn (tables 31, 32, and 33). Average labor costs by departments for the mills surveyed exceeded those indicated for Model mills by amounts ranging from 44 percent for drawing to 181 percent for fly frames, for 10s hosiery yarn; from 14 percent for opening and picking to 147 percent for fly frames, for 20s hosiery yarns; and from the same labor costs for drawing to 134 percent for fly frames, for 30s hosiery yarn. In some departments the costs of labor for some of the mills were as low as or lower than those indicated for Model mills but these relatively low costs are accounted for mainly by differences in wage rates, as explained above.

OVERHEAD COSTS

Information assembled for the 15 mills shows that overhead expenses per pound of yarn ranged from 2.83 cents to 4.78 cents and averaged 3.72 cents for 10s hosiery yarns, compared with 3.78 cents for the Model mill; from 4.19 cents to 7.44 cents and averaged 5.88 cents for 20s hosiery yarns, compared with 6.64 cents for the Model mill; and from 6.14 cents to 9.18 cents and averaged 7.87 cents for 30s hosiery yarns, compared with 9.14 cents for the Model mill (table 37).

The proportions of total mill costs of carded cotton yarns accounted for by overhead expenses ranged from 5.4 percent to 9.1 percent and averaged 7 percent for 10s hosiery yarns, compared with 7.6 percent for the Model mill; from 7.3 percent to 12.9 percent and averaged 10 percent for 20s hosiery yarns, compared with 11.9 percent for the Model mill; and from 9.7 percent to 15 percent and averaged 12.4 percent for 30s hosiery yarns, compared with 14.9 percent for the Model mill. Overhead costs for warp yarns are about the same as those for hosiery yarns (table 37).

The relatively large depreciation indicated for Model mills is mainly responsible for the fact that these overhead costs exceed those for the mills surveyed (table 37). Power costs, taxes, and insurance, for Model mills are also high in relation to those for the 15 mills. Supplies and repairs, salaries, and other expenses for the mills surveyed are high in relation to those indicated for Model mills. These results would appear to indicate that the possibilities of reducing overhead expenses are not so great as those indicated above for labor costs.

TABLE 37.—Overhead costs per pound of manufacturing carded cotton yarn by mills, by kinds of yarn, and by items of cost, United States, May 1950 ¹

Mill	Overhead costs									
	Supplies and repairs	Power	Insurance		Taxes, property	Deprecia- tion	Fuel	Other	Salaries	Total
			Liability	Other						
	10s hosiery yarn									
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
B-----	1. 04	0. 78	0. 04	0. 12	0. 13	0. 32	0. 07	0. 28	0. 89	3. 67
F-----	1. 04	. 70	. 13	. 17	. 15	. 44	. 04	. 39	1. 00	4. 06
H-----	1. 02	. 67	. 16	. 04	. 10	. 78	. 11	. 62	1. 28	4. 78
J-----	1. 14	. 53	. 03	. 04	. 08	. 37	. 02	. 13	. 53	2. 87
K-----	. 76	. 82	. 05	. 11	. 27	. 62	. 07	. 04	. 92	3. 66
N-----	1. 08	. 51	. 05	. 09	. 25	. 48	. 04	. 17	1. 67	4. 34
R-----	. 97	. 43	. 12	. 05	. 12	. 39	. 03	. 15	. 57	2. 83
S-----	1. 04	. 66	. 09	. 10	. 22	. 36	. 09	. 13	. 67	3. 36
T-----	. 94	. 64	. 08	. 09	. 11	. 67	. 10	. 19	. 96	3. 78
V-----	1. 06	. 64	. 02	. 02	. 09	. 26	. 07	1. 16	. 51	3. 83
Average---	1. 01	. 64	. 08	. 08	. 15	. 47	. 06	. 33	. 90	3. 72
Model-----	. 85	. 64	. 03	. 11	. 15	1. 25	. 05	. 17	. 53	3. 78

20s hosiery yarn

B-----	1.47	1.12	0.06	0.17	0.19	0.45	0.10	0.40	1.27	5.23
F-----	1.51	1.02	.19	.24	.21	.65	.05	.57	1.46	5.90
H-----	1.56	1.02	.25	.07	.15	1.20	.17	.95	1.94	7.31
I-----	1.74	1.13	.06	.12	.11	1.45	.12	.53	2.18	7.44
J-----	1.67	.77	.05	.06	.11	.53	.03	.19	.78	4.19
K-----	1.14	1.23	.08	.16	.40	.93	.11	.07	1.39	5.51
N-----	1.68	.80	.07	.14	.39	.75	.07	.27	2.56	6.73
O-----	1.64	1.33	.08	.06	.28	1.08	.09	.17	1.42	6.15
R-----	1.45	.65	.19	.07	.19	.58	.04	.22	.85	4.24
T-----	1.32	.90	.11	.13	.15	.94	.14	.27	1.34	5.30
U-----	1.60	.93	.05	.05	.10	.55	.04	2.13	1.22	6.67
Average---	1.52	.99	.11	.12	.21	.83	.09	.52	1.49	5.88
Model-----	1.25	1.25	.05	.18	.25	2.11	.09	.35	1.11	6.64

30s hosiery yarn

I-----	2.16	1.39	0.07	0.14	0.13	1.80	0.14	0.65	2.70	9.18
J-----	2.45	1.13	.07	.08	.17	.78	.04	.28	1.14	6.14
K-----	1.55	1.68	.11	.22	.55	1.26	.15	.09	1.89	7.50
O-----	2.20	1.79	.10	.09	.38	1.44	.13	.22	1.91	8.26
U-----	1.99	1.16	.06	.06	.12	.69	.05	2.64	1.50	8.27
Average---	2.07	1.43	.08	.12	.27	1.19	.10	.78	1.83	7.87
Model-----	1.65	1.62	.07	.25	.33	2.76	.12	.56	1.78	9.14

¹ Data are for 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

Overhead expenses for the mills surveyed include costs for the following items.

Supplies and repairs accounted, on the average, for somewhat more than one-fourth of total overhead costs to manufacturers of carded cotton yarn. Costs of miscellaneous supplies, machine parts, building and machine repair materials, and repairs made by outside contractors (no packing supplies or labor in this item), are included.

Power accounted for about 17 percent of total overhead costs and includes only invoices for purchased power.

Insurance, including workman's compensation, group, and all other forms except life insurance, accounted for about 4 percent of overhead costs.

Taxes (property, etc.) include all taxes except income taxes and social security taxes and accounted for about 4 percent of total overhead expenses.

Depreciation, which is self-explanatory, accounted for about 14 percent of overhead costs.

Fuel accounted for less than 2 percent of overhead costs and includes fuel for heating and conditioning only.

Other expenses include all other overhead expenses not otherwise classified, such as telephone and telegraph, subscriptions and dues, travel, office supplies, auditing, and miscellaneous. These items accounted for about 9 percent of total overhead costs.

Salaries include salaries of officers and executives, clerical workers, and superintendents (overseers or foremen's salaries have been included in labor costs), and the total for all accounted for somewhat less than one-fourth of total overhead costs.

An examination of detailed data on overhead costs for individual mills shows wide variations in the items of costs among mills and among the various kinds of yarns produced (table 37). Total overhead cost per pound and costs of individual items usually vary directly with the fineness of the yarn, but an examination of the data presented in table 37 shows that costs of individual items and total overhead cost for all items for 10s hosiery yarn were higher for some mills than the corresponding costs for 20s hosiery yarn in other mills. These costs to some mills for 20s hosiery yarn were greater than the corresponding costs to other mills for 30s hosiery yarn. Costs for individual items included in overhead expenses varied widely among mills. Costs for most of these items were more than three times greater for some mills than for other mills manufacturing the same kind of yarn.

Overhead costs by departments also show wide variations among mills surveyed (tables 31, 32, and 33). Data on costs by departments show that costs for some mills exceeded those for other mills which were manufacturing the same kinds of yarn by amounts ranging from 63 percent to more than 600 percent of the mills with lowest costs. Total overhead costs for roving for the highest cost mill, which accounted on the average for 54 percent of total overhead costs

for 10s hosiery and 43 percent for 20s hosiery yarns, exceeded those for the lowest cost mill by 78 percent for 10s hosiery and by more than 100 percent for 20s hosiery yarns. Overhead costs for spinning, accounting for about 31 percent of total overhead cost for 10s hosiery and almost 44 percent for 20s hosiery yarns, for the highest cost mill, exceeded those for the lowest cost mill by 90 percent for 10s hosiery and almost 80 percent for 20s hosiery yarns. Even greater proportional differences are shown for overhead costs for winding. These overhead costs by departments for the mills surveyed ranged from substantially below to considerably above those indicated for Model mills.

Such differences in overhead costs indicate the need for and possibilities of improvements. If adjustments were made so that overhead costs for each department in each mill would approximate that of the lowest cost mill for that department, total overhead costs for 10s hosiery yarn would be reduced 13 percent below that for the lowest cost mill and 48 percent below that for the highest cost mill, and total overhead costs for 20s hosiery yarn would be reduced 6 percent below that for the lowest cost mill and 47 percent below that for the highest cost mill. But the fact that overhead costs for the mills surveyed are, in many instances, as low as or lower than those shown for Model mills indicates that the possibilities of reduction in overhead costs are limited.

Any plans for adjustments designed to reduce overhead costs would obviously need to take into account the influences of such adjustments on labor and other costs. Data regarding deviations in overhead and in labor costs for individual mills from the average for all mills producing 10s hosiery and 20s hosiery yarns show that for most of the departments the deviations in overhead and in labor costs were in the same direction for most of the mills. But for all departments combined, these deviations were in the opposite direction for most mills.

OTHER COSTS

Manufacturing costs, other than those for labor and overhead, include social security and old-age benefit taxes, vacation pay, costs of packing materials, and freight. The combined amounts of these "other" costs, for the 15 mills surveyed, ranged from 2.02 cents per pound to 2.79 cents and averaged 2.48 cents for 10s hosiery yarn, compared with 2.26 cents for the Model mill; from 2.13 cents to 3.01 cents and averaged 2.58 cents for 20s hosiery yarns, compared with 2.36 cents for the Model mill; and from 2.31 cents to 2.98 cents and averaged 2.68 cents for 30s hosiery yarns, compared with 2.46 cents for the Model mill (table 38).

TABLE 38.—*Cost per pound of yarn to manufacturers for taxes, vacation pay, packing materials, and freight, by kind of carded cotton yarn and by mills, United States, May 1950*¹

Mill	Total	Taxes ²	Vacation pay	Packing materials	Freight
10s hosiery yarn					
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
B.....	2. 17	0. 22	0	0. 88	1. 07
F.....	2. 02	. 19	. 17	. 59	1. 07
H.....	2. 78	. 19	. 30	1. 19	1. 10
J.....	2. 49	. 17	. 23	1. 00	1. 09
K.....	2. 43	. 18	. 17	. 99	1. 09
N.....	2. 50	. 21	. 23	. 97	1. 09
R.....	2. 54	. 24	. 18	1. 03	1. 09
S.....	2. 52	. 23	. 22	1. 03	1. 04
T.....	2. 63	. 24	. 23	1. 12	1. 04
V.....	2. 79	. 17	. 22	1. 32	1. 08
Average ³	2. 48	. 20	. 20	1. 01	1. 07
Model.....	2. 26	. 10	. 08	1. 00	1. 08
20s hosiery yarn					
B.....	2. 24	0. 29	0	0. 88	1. 07
F.....	2. 13	. 25	. 22	. 59	1. 07
H.....	3. 01	. 28	. 44	1. 19	1. 10
I.....	2. 44	. 24	0	1. 09	1. 11
J.....	2. 69	. 26	. 34	1. 00	1. 09
K.....	2. 58	. 26	. 24	. 99	1. 09
N.....	2. 72	. 32	. 34	. 97	1. 09
O.....	2. 23	. 19	0	. 97	1. 07
R.....	2. 70	. 33	. 25	1. 03	1. 09
T.....	2. 73	. 29	. 28	1. 12	1. 04
U.....	2. 88	. 30	. 37	1. 13	1. 08
Average ³	2. 58	. 27	. 23	1. 00	1. 08
Model.....	2. 36	. 16	. 12	1. 00	1. 08
30s hosiery yarn					
I.....	2. 48	0. 28	0	1. 09	1. 11
J.....	2. 90	. 35	. 46	1. 00	1. 09
K.....	2. 73	. 34	. 31	. 99	1. 09
O.....	2. 31	. 27	0	. 97	1. 07
U.....	2. 98	. 34	. 43	1. 13	1. 08
Average ³	2. 68	. 32	. 24	1. 03	1. 09
Model.....	2. 46	. 22	. 16	1. 00	1. 08

See footnotes at end of table.

TABLE 38.—*Cost per pound of yarn to manufacturers for taxes, vacation pay, packing materials and freight, by kind of carded cotton yarn and by mills, United States, May 1950*¹—Continued

Mill	Total	Taxes ²	Vacation pay	Packing materials	Freight
10s warp yarn					
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
B-----	2. 18	0. 23	0	0. 88	1. 07
H-----	2. 78	. 19	. 30	1. 19	1. 10
K-----	2. 43	. 18	. 17	. 99	1. 09
N-----	2. 49	. 21	. 22	. 97	1. 09
S-----	2. 54	. 24	. 23	1. 03	1. 04
Average ³ -----	2. 48	. 21	. 18	1. 01	1. 08
Model-----	2. 26	. 10	. 08	1. 00	1. 08
20s warp yarn					
B-----	2. 25	0. 30	0	0. 88	1. 07
C-----	2. 11	. 22	0	. 82	1. 07
D-----	1. 90	. 21	0	. 59	1. 10
H-----	3. 03	. 29	. 45	1. 19	1. 10
K-----	2. 57	. 26	. 23	. 99	1. 09
N-----	2. 73	. 32	. 35	. 97	1. 09
Average ³ -----	2. 43	. 27	. 17	. 91	1. 08
Model-----	2. 36	. 16	. 12	1. 00	1. 08
30s warp yarn					
D-----	1. 96	0. 27	0	0. 59	1. 10
K-----	2. 75	. 35	. 32	. 99	1. 09
Average ³ -----	2. 36	. 31	. 16	. 79	1. 10
Model-----	2. 46	. 22	. 16	1. 00	1. 08

¹ Data are for 15 mills selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills.

² Selling expenses are not included. These expenses averaged 2.68 percent of sales for 10s hosiery yarn, 2.98 percent for 20s hosiery yarn, 3.19 percent for 30s hosiery yarn, 2.57 percent for 10s warp yarn, 2.97 percent for 20s warp yarn, and 2.50 percent for 30s warp yarn.

³ Straight or simple overage.

Social security and old-age benefit taxes accounted for only a small proportion of total costs. They are calculated as a percentage of total labor cost in each instance. The proportions for the mills surveyed ranged from 1.9 percent to 2.8 percent of total labor costs. Consequently, costs of these taxes per pound of yarn vary considerably among mills and from one yarn to another (table 38).

Vacation pay is also a small item of the cost in the manufacture of carded cotton yarns (table 38). At the time information was collected on costs, the practice of each mill with regard to paid vacations was ascertained. This information was used in calculating the costs of vacation pay, and these expenses were calculated as percentages of labor costs. The results show that the costs of vacation pay in two-thirds of the mills ranged from 2 percent to 3.65 percent of the costs of labor. Five of the mills showed no expense for vacation pay.

Packing materials include cones, paper, cases, strapping, etc. Costs of these materials ranged from 0.59 cent to 1.32 cents and averaged about 1 cent per pound of yarn.

Freight for delivery of yarn to customers cost on the average about 1.08 cents per pound of yarn. These costs were arrived at on the basis of the experiences of the mills and they are fairly uniform among mills and for the different yarns produced (table 38).

DATA FOR INDIVIDUAL MILLS WITH COMPARISONS

In the preceding sections, data are presented to show results for the 15 mills surveyed taken as a group, along with specifications and operating results indicated for Model mills. As the 15 mills were selected to constitute as nearly as possible a representative cross section of the various types of conditions of operations in carded cotton-yarn mills, the presentation gives some indication of the conditions and operating results for the carded cotton-yarn manufacturing industry as a whole. Attention was called to some of the more significant differences among the mills surveyed and between these mills and those indicated for Model mills, as a basis for indicating the needs for and possibilities of improvements and what appears to be the most feasible means of increasing the efficiency and reducing the costs for the industry taken as a whole.

Data for individual mills listed in code to prevent revealing the identity of individual concerns, and for Model mills, are given in this section of the bulletin for more detailed consideration. A brief description of each mill is followed by data on costs and related information for the specified mill and those for Model mills, along with explanations of the differences shown.

MILL B

Mill B is a small plant operating less than 7,000 spindles compared with about 10,000 spindles indicated for Model mills. The standard weekly pay roll of \$2,182 totals about 43 percent of the average for the 15 mills surveyed. It spins a "low" (1 to 3) number of counts of yarn. Data are shown for 10s hosiery, 10s warp, and 20s hosiery yarns for comparison with those indicated for Model mills.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill B, averaging 55.88 cents for 10s yarn and 60.62 cents for 20s yarn, are 12 percent and 8 percent, respectively, higher than those for Model mills (table 39). The cotton used was about the same in grade. The staple ranged from that which was about the same as that indicated for the Model mills to a staple somewhat longer than that of the Model mills. Total manufacturing costs, averaging 15.74 cents per pound for 10s yarn and 20.48 cents for 20s yarn, are 48 percent and 26 percent, respectively, higher than those indicated for the Model mills. Labor costs are substantially larger but overhead and other manufacturing costs are somewhat less than for the Models. The weighted average hourly wage rate of 93 cents per hour was about 10 percent lower than the rates indicated for Model mills. Production of yarn per man-hour, averaging about 9.5 pounds for 10s yarn and 7.3 pounds for 20s yarn, are about 60 percent and 50 percent, respectively, less than those for Model mills, and labor costs per pound of yarn are more than twice as large for 10s yarn and 80 percent larger for 20s yarn, than for Model mills.

Data on costs and related factors, with explanations of the differences in the costs shown, follow.

TABLE 39.—*Mill B: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	Hosiery yarn		Warp yarn	
	10s	20s	10s	20s
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Total cost of yarn ² -----	55. 75	60. 33	56. 02	60. 92
Net cotton cost ³ -----	40. 15	40. 15	40. 15	40. 15
Manufacturing cost-----	15. 60	20. 18	15. 87	20. 77
Labor ⁴ -----	9. 76	12. 71	9. 90	13. 11
Overhead-----	3. 67	5. 23	3. 79	5. 41
Other-----	2. 17	2. 24	2. 18	2. 25
Taxes ⁵ -----	. 22	. 29	. 23	. 30
Packing materials-----	. 88	. 88	. 88	. 88
Freight-----	1. 07	1. 07	1. 07	1. 07

See footnotes at end of table

TABLE 39.—*Mill B: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹—Continued

Item	Hosiery yarn		Warp yarn	
	10s	20s	10s	20s
	Proportion of total cost of yarn			
	Percent 100. 0	Percent 100. 0	Percent 100. 0	Percent 100. 0
Total cost of yarn ² -----				
Net cotton cost ³ -----	72. 0	66. 6	71. 7	65. 9
Manufacturing cost-----	28. 0	33. 4	28. 3	34. 1
Labor ⁴ -----	17. 5	21. 1	17. 7	21. 5
Overhead-----	6. 6	8. 6	6. 7	8. 9
Other-----	3. 9	3. 7	3. 9	3. 7
Taxes ⁵ -----	. 4	. 5	. 4	. 5
Packing materials-----	1. 6	1. 4	1. 6	1. 4
Freight-----	1. 9	1. 8	1. 9	1. 8

¹ All costs are adjusted to two shifts or 80 hours per week.² Discounts and selling expenses not included.³ The cotton averaged Middling in grade and 1 inch plus in length of staple. The price, 35.47 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.132, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on pay roll except superintendence, which is included in overhead cost.⁵ Social security and old-age benefits which account for 2.30 percent of labor cost.TABLE 40.—*Mill B and Model Mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill B	Model mill	Difference
Roving:			
Handling and storage:			
Overhead-----	Cents 0. 10	Cents 0. 06	Cents 0. 04
Labor-----	. 24	. 17	. 07
Total-----	. 34	. 23	. 11
Opening and picking:			
Overhead-----	. 44	. 37	. 07
Labor-----	. 79	. 24	. 55
Total-----	1. 23	. 61	. 62

See footnotes at end of table.

TABLE 40.—*Mill B and Model Mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill B	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 76	1. 17	² 0. 41
Labor.....	1. 30	. 62	. 68
Total.....	2. 06	1. 79	. 27
Drawing:			
Overhead.....	. 33	. 29	. 04
Labor.....	. 67	. 37	. 30
Total.....	1. 00	. 66	. 34
Fly frames:			
Overhead.....	. 35	. 26	. 09
Labor.....	1. 10	. 43	. 67
Total.....	1. 45	. 69	. 76
Total roving cost:			
Overhead.....	1. 98	2. 15	² . 17
Labor.....	4. 10	1. 83	2. 27
Total.....	6. 08	3. 98	2. 10
Spinning:			
Overhead.....	. 95	1. 29	² . 34
Labor.....	2. 72	1. 40	1. 32
Total.....	3. 67	2. 69	. 98
Winding:			
Overhead.....	. 65	. 28	. 37
Labor.....	2. 55	1. 10	1. 45
Total.....	3. 20	1. 38	1. 82
Packing and shipping:			
Overhead.....	. 09	. 06	. 03
Labor.....	. 39	. 17	. 22
Total.....	. 48	. 23	. 25
Total cost:			
Overhead.....	3. 67	3. 78	² . 11
Labor.....	9. 76	4. 50	5. 26
Total.....	13. 43	8. 28	5. 15

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill B averaged Middling in grade and 1 inch plus in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill B.

EXPLANATION OF DIFFERENCES IN COSTS, MILL B VS. MODEL MILL, 10s
HOSIERY YARN (TABLE 40)

OVERHEAD.—Mill B has a total overhead cost per pound of 3.67 cents which is 0.11 cent per pound of yarn less than the total figure for the Model mill. Without depreciation, however, the total cost exceeds that of the Model mill by 0.82 cent, most of which is accounted for by supplies, repairs, power, and salaries.

LABOR.—This mill uses a 1.50 hank (10- by 5-inch) roving, made in one process in the card room, compared with 1.00 hank roving in the Model mill, which explains some of the difference of 0.67 cent per pound in labor costs at the fly frames. In addition, Mill B labor costs are 1.6 cents per pound higher in the preparatory departments because of smaller job sizes and the lower productions per machine hour.

The excess of 1.32 cents per pound in spinning costs in Mill B is due to lower production per spindle hour, spinners handling a smaller number of spindles, doffers handling fewer bobbins, and section men etc., having smaller job sizes.

There is a difference of 1.32 cents per pound in the cost for winder tenders in the two mills, some of which is due to the smaller spinning ring (2 inches) in this mill, and to the fact that the winder hands produce fewer pounds per hour than those set up in the Model mill.

That the packer hands handle fewer pounds explains most of the difference in cost for this item in the two mills.

TABLE 41.—*Mill B and Model mill: Average overhead and labor cost per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill B	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0. 10	Cents 0. 09	Cents 0. 01
Labor.....	. 24	. 21	. 03
Total.....	. 34	. 30	. 04
Opening and picking:			
Overhead.....	. 44	. 51	. 07
Labor.....	. 79	. 36	. 43
Total.....	1. 23	. 87	. 36
Carding:			
Overhead.....	. 76	1. 25	. 49
Labor.....	1. 30	. 76	. 54
Total.....	2. 06	2. 01	. 05

See footnotes at end of table.

TABLE 41.—*Mill B and Model mill: Average overhead and labor cost per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill B	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 33	0. 32	0. 01
Labor.....	. 67	. 33	. 34
Total.....	1. 00	. 65	. 35
Fly frames:			
Overhead.....	. 73	. 59	. 14
Labor.....	1. 94	. 74	1. 20
Total.....	2. 67	1. 33	1. 34
Total roving cost:			
Overhead.....	2. 36	2. 76	² 40
Labor.....	4. 94	2. 40	2. 54
Total.....	7. 30	5. 16	2. 14
Spinning:			
Overhead.....	2. 13	3. 22	² 1. 09
Labor.....	4. 83	2. 88	1. 95
Total.....	6. 96	6. 10	. 86
Winding:			
Overhead.....	. 65	. 53	. 12
Labor.....	2. 55	1. 57	. 98
Total.....	3. 20	2. 10	1. 10
Packing and shipping:			
Overhead.....	. 09	. 13	² 04
Labor.....	. 39	. 20	. 19
Total.....	. 48	. 33	. 15
Total cost:			
Overhead.....	5. 23	6. 64	² 1. 41
Labor.....	12. 71	7. 05	5. 66
Total.....	17. 94	13. 69	4. 25

¹ All costs are adjusted to 2 shifts or 80 hours per week. The quality of the cotton used by Mill B averaged Middling in grade, 1 inch plus in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill B.

The shop and outside payroll in Mill B is high in comparison with that of the Model mill, and as each department gets a share of this payroll, it is responsible for a portion of the excess labor costs in the various departments.

Mill B's labor cost per pound is higher by 5.26 cents, but the average rate per hour in Mill B is 10 percent below that of the Model mill. On the basis of the same average hourly rate, this difference would be increased by 1.10 cents per pound.

EXPLANATION OF DIFFERENCES IN COSTS, MILL B VS. MODEL MILL, 20s HOSIERY YARN (TABLE 41)

OVERHEAD.—The total overhead cost per pound, without depreciation is 4.78 cents in Mill B, compared with 4.53 cents in the Model mill, and this difference of 0.25 cent is mainly due to higher costs of supplies and repairs, and salaries. This mill has an advantage of 1.66 cents per pound over the Model mill, owing to low depreciation expense, and shows an over-all cost of 1.40 cents per pound lower than the Model mill. It falls in the "small" group, as compared with the "medium" size for the Model mill.

LABOR.—Compared with the Model mill the opening and picking cost per pound in Mill B is 0.43 cent higher; the main reason for this difference is the extra processes of picking.

The carding cost per pound is 0.54 cent higher because of smaller job sizes, and for the same reason the drawing cost per pound is 0.34 cent higher.

On the fly frames cost per pound is 1.20 cents higher than for the Model mill. Most of this difference is accounted for by the fact that Mill B is spinning 20s hosiery yarn out of 3.32 hank roving, whereas the Model mill is expected to spin the same yarn out of 2.00 hank roving.

The spinning cost per pound is 1.95 cents per pound higher than for the Model, and 1 cent of this is due to the spinners having smaller job sizes. The balance of 0.95 cent is due to higher man-hours, for the pounds produced, for the other employees in this department, as compared to the Model mill.

Winding cost is 0.98 cent per pound higher than the Model mill, largely as a result of the winder tenders having smaller job sizes, than for the Model mill. These tenders jobs are affected somewhat by a smaller spinning bobbin.

The packing and shipping costs are 0.19 cent per pound higher, because the packers are not packing as many pounds as those set up in the Model mill.

The total labor cost in Mill B is 5.66 cents per pound higher and the average hourly wage rate is about 10 percent lower than for the Model mill. This difference in wages would amount to about 1.42 cents per pound of yarn.

TABLE 42.—*Mill B and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill B, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill B
	10s hosiery yarn			20s hosiery yarn			
	Mill B	Model mill	Differ- ence	Mill B	Model mill	Differ- ence	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 04	0. 85	0. 19	1. 47	1. 25	0. 22	4. 91
Power-----	. 78	. 64	. 14	1. 12	1. 25	² . 13	3. 74
Insurance:							
Liability-----	. 04	. 03	. 01	. 06	. 05	. 01	. 21
Other-----	. 12	. 11	. 01	. 17	. 18	² . 01	. 59
Taxes (property)-----	. 13	. 15	² . 02	. 19	. 25	² . 06	. 63
Depreciation-----	. 32	1. 25	² . 93	. 45	2. 11	² 1. 66	1. 51
Fuel-----	. 07	. 05	. 02	. 10	. 09	. 01	. 34
Other expenses-----	. 28	. 17	. 11	. 40	. 35	. 05	1. 36
Salaries, etc-----	. 89	. 53	. 36	1. 27	1. 11	. 16	4. 24
Total-----	3. 67	3. 78	² . 11	5. 23	6. 64	² 1. 41	17. 53

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Cost for Model mill larger than cost for Mill B.TABLE 43.—*Mill B: Summary of standard weekly pay roll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week
	Dollars
Handling and storage	31. 96
Opening and picking	106. 33
Carding	176. 08
Drawing	89. 96
8- by 4-inch frames	187. 85
10- by 5-inch frames	45. 26
Spinning	633. 07
Spooling	373. 21
Twisting	273. 21
Winding	229. 52
Packing and shipping	35. 21
Total	2, 181. 66

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 44.—*Mill B: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total pay- roll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Opener hand.....	30	0. 87	26. 10
Picker tenders.....	60	. 87	52. 20
Card tenders.....	80	. 87	69. 60
Drawing tenders.....	80	. 87	69. 60
Speeder tenders.....	160	1. 02	163. 20
Roving haulers.....	80	. 87	69. 60
Overseer.....	40	-----	60. 00
Assistant overseer.....	40	. 87	34. 80
Spinning, twisting, winding, and pack- ing and shipping:			
Section man.....	80	. 95	76. 00
Spinners.....	400	. 87	348. 00
Doffers.....	160	. 87	139. 20
Piece-up hands.....	80	. 89	71. 20
Spooler tenders.....	400	. 87	348. 00
Twister tenders.....	240	. 87	208. 80
Winder tenders.....	240	. 87	208. 80
Shop and outside:			
Mechanic.....	40	1. 25	50. 00
Carpenter.....	40	1. 25	50. 00
Watchman.....	40	. 87	34. 80
Watchman, week end.....	48	. 87	41. 76
Night superintendent.....	-----	-----	60. 00
Total or average.....	-----	. 93	2, 181. 66

TABLE 45.—*Mill B and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		10s warp yarn	
		Mill B	Model mill	Mill B	Model mill
Cotton used:					
Grade.....		M	M	M	M
Staple length ¹	Inch.....	1+	1	1+	1
Picker lap.....	Ounce.....	14	14	14	14
Quantity per picker week (40 hours).....	Pound.....	7, 223	11, 850	7, 223	11, 425
Card sliver.....	Grain.....	52. 5	55	52. 5	55
Quantity per card week (40 hours).....	Pound.....	327	368	327	368
Finished drawing sliver.....	Grain.....	56. 5	55	56. 5	55
Quantity per finisher delivery week (40 hours).....	Pound.....	345	595	345	595
Slubber (1st process): Hank roving.....	-----	1. 50	1. 00	1. 50	1. 00

See footnote at end of table.

TABLE 45.—*Mill B and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950—Continued*

Item	Unit	10s hosiery yarn		10s warp yarn	
		Mill B	Model mill	Mill B	Model mill
Spinning:					
Revolutions per minute, front roll.....		179	187	155	179
Twist multiplier.....		3. 50	3. 50	4. 75	4. 50
Quantity per spindle (40 hours).....	Pound	3. 85	4. 25	3. 40	4. 10
		20s hosiery yarn		20s warp yarn	
Cotton used:		M	M	M	M
Grade.....		1+	1½	1+	1½
Staple length ¹	Inch	14	14	14	14
Picker lap.....	Ounce	14	14	14	14
Quantity per picker week (40 hours).....	Pound	7, 223	9, 600	7, 223	9, 350
Card sliver.....	Grain	52. 5	55	52. 5	55
Quantity per card week (40 hours).....	Pound	327	368	327	368
Finisher drawing sliver.....	Grain	56. 5	55	56. 5	55
Quantity per finisher delivery week (40 hours).....	Pound	345	575	345	575
Slubber: Hank roving.....		3. 32	2. 00	3. 32	2. 00
Spinning:					
Revolutions per minute, front roll.....		156	148	143	142
Twist multiplier.....		3. 50	3. 50	4. 75	4. 50
Quantity per spindle (40 hours).....	Pound	1. 71	1. 70	1. 58	1. 66

¹ Plus (+) indicates slightly longer staple.

MILL C

Mill C is classified as a "medium" (7,000 to 14,000 spindles) sized mill, compared with about 10,000 spindles indicated for the Model mill. The standard weekly pay roll of \$4,240 is 84 percent of the average for the 15 mills surveyed and is 67 percent greater than that indicated for the Model for 20s yarn. It spins a "low" (1 to 3) number of counts of yarn, and data for 20s warp yarn only are shown as a basis of comparison with the Model mill.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill C, amounting to 55.52 cents for 20s warp yarn, compare with 56.27 cents indicated for the Model mill, but the skein strength and appearance of the yarn produced are relatively low (table 46). The cotton used was lower in grade and shorter in staple, and net cotton costs averaged 37.69 cents per pound of yarn compared with 39.92 cents for the Model. Total manufacturing cost averaged 1.48 cents per pound, or about 9 percent more than that for the Model mill. Labor cost averaged 3.34 cents per pound more but overhead cost averaged 1.61 cents and other costs averaged 0.25 cent less than indicated for the Model. The weighted average hourly wage rate of 97 cents for Mill C compared with \$1.05 for the Model, but the quantity of yarn produced per man-hour averaged 9.33 pounds compared with 14.78 pounds, and total labor cost per pound of yarn averaged 10.43 cents compared with 7.09 cents for the Model mill.

Detailed data on costs and related data, with explanations of the differences in costs shown, follow.

TABLE 46.—*Mill C: Average cost per pound for 20s warp carded cotton yarn, United States, May 1950*¹

Item	Cost per pound	
	Cents	Percent
Total cost of yarn ²	55. 52	100. 0
Net cotton cost ³	37. 69	67. 9
Manufacturing cost.....	17. 83	32. 1
Labor ⁴	10. 43	18. 8
Overhead.....	5. 29	9. 5
Other.....	2. 11	3. 8
Taxes ⁵.....	. 22	. 4
Packing materials.....	. 82	1. 5
Freight.....	1. 07	1. 9

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged Strict Low Middling plus in grade and 1 inch in length of staple. The price, 33.44 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.127, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.10 percent of labor cost.

TABLE 47.—*Mill C and Model mill: Average overhead and labor costs per pound for 20s warp cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill C	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 10	0. 09	0. 01
Labor.....	. 38	. 22	. 16
Total.....	. 48	. 31	. 17
Opening and picking:			
Overhead.....	. 37	. 53	². 16
Labor.....	. 37	. 37	0
Total.....	. 74	. 90	². 16
Carding:			
Overhead.....	. 74	1. 30	². 56
Labor.....	. 96	. 79	. 17
Total.....	1. 70	2. 09	². 39
Drawing:			
Overhead.....	. 25	. 33	². 08
Labor.....	. 60	. 34	. 26
Total.....	. 85	. 67	. 18
Fly frames:			
Overhead.....	. 47	. 61	². 14
Labor.....	1. 13	. 77	. 36
Total.....	1. 60	1. 38	. 22
Total roving cost:			
Overhead.....	1. 93	2. 86	². 93
Labor.....	3. 44	2. 49	. 95
Total.....	5. 37	5. 35	. 02
Spinning:			
Overhead.....	2. 37	3. 35	². 98
Labor.....	4. 02	2. 99	1. 03
Total.....	6. 39	6. 34	. 05
Winding:			
Overhead.....	. 85	. 55	. 30
Labor.....	2. 64	1. 40	1. 24
Total.....	3. 49	1. 95	1. 54

See footnotes at end of table.

TABLE 47.—*Mill C and Model mill: Average overhead and labor costs per pound for 20s warp cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill C	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 14	0. 14	0
Labor.....	. 33	. 21	. 12
Total.....	. 47	. 35	. 12
Total cost:			
Overhead.....	5. 29	6. 90	² 1. 61
Labor.....	10. 43	7. 09	3. 34
Total.....	15. 72	13. 99	1. 73

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill C averaged Strict Low Middling plus in grade and 1 inch in length of staple whereas Middling 1½-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill C.

EXPLANATION OF DIFFERENCES IN COSTS, MILL C VS. MODEL MILL, 20S WARP YARN (TABLE 47)

OVERHEAD.—The total overhead cost per pound, without depreciation, in Mill C is 0.25 cent lower than in the Model mill principally because of lower costs of power and taxes.

LABOR.—The total roving cost per pound is 0.95 cent higher than in the Model mill. As the processes and hank roving produced are the same as those of the Model mill, the principal reason for the difference in cost is the lower productions per machine hour and pounds per hour handled by the employees.

The spinning cost per pound is 1.03 cents higher than in the Model mill, of which 0.56 cent is due to spinners having smaller job sizes. The balance of 0.47 cent per pound is due to the fact that other laborers (as doffers and sweepers, oilers and banders, section men, etc.) are not handling as many pounds per hour as those of similar employees in the Model mill.

The winding cost per pound is 1.24 cents higher than in the Model of which only 0.05 cent is due to winder tenders. This means that the principal reason for the difference in cost is the fact that other laborers (as fixers, sweepers, yarn men, etc.) are not handling as many pounds as similar employees in the Model mill.

The total labor cost per pound in Mill C is high by 3.34 cents per pound. The average hourly wage rate is about 7.16 percent lower than in the Model mill. This difference in wage rate would amount to about 0.80 cent per pound of yarn.

TABLE 48.—*Mill C and Model mill: Overhead costs per pound and differences, for 20s warp yarn, and costs per spindle per week of 80 hours for Mill C, United States, May 1950*¹

Item	Cost per pound			Cost per spindle per week, Mill C
	Mill C	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	1. 21	1. 29	² 0. 08	3. 24
Power.....	1. 11	1. 36	² 1. 25	2. 96
Insurance:				
Liability.....	. 05	. 05	0	. 12
Other.....	. 16	. 19	² 0. 03	. 42
Taxes (property).....	. 13	. 25	² 1. 12	. 35
Depreciation.....	. 81	2. 17	² 1. 36	2. 17
Fuel.....	. 05	. 09	² 1. 04	. 14
Other expenses.....	. 42	. 36	. 06	1. 12
Salaries, etc.....	1. 35	1. 14	. 21	3. 63
Total.....	5. 29	6. 90	² 1. 61	14. 15

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill C.

TABLE 49.—*Mill C: Summary of standard weekly pay roll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week
Handling and storage.....	\$116. 45
Opening and picking.....	115. 59
Carding.....	296. 45
Drawing.....	187. 30
Slubbers.....	350. 72
Spinning.....	1, 285. 59
Winding (twisting).....	631. 70
Twisting.....	819. 74
Warping.....	161. 77
Winding.....	236. 02
Packing and shipping.....	39. 07
Total.....	4, 240. 40

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 50.—*Mill C: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseer.....	40		59. 20
Opening and picking tenders.....	80	0. 92	73. 60
Card tenders.....	160	. 92	147. 20
Card grinders.....	80	1. 09	87. 20
Lap winder tenders.....	80	. 92	73. 60
Drawing tenders.....	80	. 92	73. 60
Slubber tenders.....	240	1. 06	254. 40
Section men.....	80	1. 09	87. 20
Roving haulers and sweepers.....	80	. 93	74. 40
Spinning and twisting:			
Overseers.....	80		118. 40
Section man.....	80	1. 09	87. 20
Oilers and banders.....	80	. 96	76. 80
Overhead cleaner.....	40	. 90	36. 00
Spinners.....	720	. 92	662. 40
Doffers and sweepers.....	320	. 93	297. 60
Twister section men.....	80	1. 06	84. 80
Twister tenders.....	240	. 92	220. 80
Twister doffers.....	320	. 92	294. 40
Twister creelers.....	80	. 92	73. 60
Winding, warping, and packing and shipping:			
Overseer.....	40		59. 20
Winder tenders.....	480	. 94	451. 20
Winder tenders.....	160	. 92	147. 20
Winder fixers.....	80	1. 04	83. 20
Sweepers and waste men.....	80	. 91	72. 80
Warper tenders.....	80	. 98	78. 40
Warper creelers.....	80	. 92	73. 60
Yarn packers.....	80	. 96	76. 80
Shop and outside:			
Mechanic.....	40	1. 35	54. 00
Mechanic helper.....	40	. 95	38. 00
Carpenter.....	40	. 97	38. 80
Outside foreman.....	40	1. 00	40. 00
Laborer.....	40	. 91	36. 40
Truck driver.....	40	. 91	36. 40
Watchman.....	40	. 90	36. 00
Scrubber.....	40	. 90	36. 00
Total or average.....	4, 360	. 97	4, 240. 40

TABLE 51.—*Mill C and Model mill; operating data and draft program, for 20s warp carded cotton yarn, United States, May 1950*

Item	Unit	Mill C	Model mill
Cotton used:			
Grade ¹ -----		SLM +	M
Staple length-----	Inch-----	1	1½
Picker lap-----	Ounce-----	14. 33	14
Quantity per picker week (40 hours)---	Pound-----	8, 293	9, 350
Card sliver-----	Grain-----	66	55
Quantity per card week (40 hours)---	Pound-----	396	368
Finisher drawing sliver-----	Grain-----	66	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	565	575
Slubber (1st process): Hank roving---		2. 04	2. 00
Spinning:			
Revolutions per minute, front roll-----		140	142
Twist multiplier-----		4. 75	4. 50
Quantity per spindle (40 hours)---	Pound-----	1. 56	1. 66

¹ Plus (+) indicates slightly higher grade.

MILL D

Mill D is a small mill, operating less than 7,000 spindles, compared with a "medium" sized Model mill. The standard weekly payroll of \$1,624 amounted to about 32 percent of the average for the 15 mills surveyed and was substantially less than that indicated for Model mills. It spins a "low" (1 to 3) number of yarn counts compared with only one count for Model mills.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill D, amounting to 56.26 cents for 20s warp yarn and 61.02 cents for 30s warp yarn, are slightly lower than those indicated for Model mills (table 52). The cotton used averaged lower in grade and about the same to somewhat shorter in staple, than for the Models and net cotton costs were less than for the Models. Total manufacturing costs, averaging 17.27 cents per pound for 20s yarn and 22.03 cents for 30s yarn, are about 6 percent and 1 percent, respectively, higher than those indicated for Model mills. Labor costs per pound are considerably higher, but overhead and other manufacturing costs are lower than for the Models. The weighted average hourly wage rate of 92.5 cents compared with \$1.05 for Model mills, but production of yarn per man-hour averaged 10.27 pounds for 20s warp yarn and 8.02 pounds for 30s warp yarn, compared with 14.78 pounds and 11.17 pounds, respectively, indicated for the Models. Total labor costs per pound of yarn averaged 9.01 cents for 20s warp yarn and 11.53 cents for 30s warp yarn compared with 7.09 cents and 9.49 cents, respectively, for Model mills.

Detailed data on costs and related data, with explanations of differences between costs, follow.

TABLE 52.—*Mill D: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	20s warp		30s warp	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ²	56. 26	100. 0	61. 02	100. 0
Net cotton cost ³	38. 99	69. 3	38. 99	63. 9
Manufacturing cost.....	17. 27	30. 7	22. 03	36. 1
Labor ⁴	9. 01	16. 0	11. 53	18. 9
Overhead.....	6. 36	11. 3	8. 54	14. 0
Other.....	1. 90	3. 4	1. 96	3. 2
Taxes ⁵.....	. 21	. 4	. 27	. 4
Packing materials.....	. 59	1. 0	. 59	1. 0
Freight.....	1. 10	2. 0	1. 10	1. 8

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Discounts and selling expenses not included.³ The cotton averaged Middling minus in grade and 1½ inches in length of staple. The price, 33.99 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.147, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.TABLE 53.—*Mill D and Model mill: Average overhead and labor cost per pound for 20s warp cotton yarn and difference, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill D	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	<i>Cents</i> 0. 09	<i>Cents</i> 0. 09	<i>Cents</i> 0
Labor.....	. 25	. 22	. 03
Total.....	. 34	. 31	. 03
Opening and picking:			
Overhead.....	. 45	. 53	. 08
Labor.....	. 39	. 37	. 02
Total.....	. 84	. 90	. 06
Carding:			
Overhead.....	. 98	1. 30	. 32
Labor.....	1. 11	. 79	. 32
Total.....	2. 09	2. 09	0

See footnotes at end of table.

TABLE 53.—*Mill D and Model mill: Average overhead and labor cost per pound for 20s warp cotton yarn and difference, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill D	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 33	0. 33	0
Labor.....	. 58	. 34	. 24
Total.....	. 91	. 67	. 24
Fly frames:			
Overhead.....	. 58	. 61	² . 03
Labor.....	. 95	. 77	. 18
Total.....	1. 53	1. 38	. 15
Total roving cost:			
Overhead.....	2. 43	2. 86	² . 43
Labor.....	3. 28	2. 49	. 79
Total.....	5. 71	5. 35	. 36
Spinning:			
Overhead.....	2. 87	3. 35	² . 48
Labor.....	3. 34	2. 99	. 35
Total.....	6. 21	6. 34	² . 13
Winding:			
Overhead.....	. 98	. 55	. 43
Labor.....	2. 17	1. 40	. 77
Total.....	3. 15	1. 95	1. 20
Packing and shipping:			
Overhead.....	. 08	. 14	² . 06
Labor.....	. 22	. 21	. 01
Total.....	. 30	. 35	² . 05
Total cost:			
Overhead.....	6. 36	6. 90	² . 54
Labor.....	9. 01	7. 09	1. 92
Total.....	15. 37	13. 99	1. 38

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill D averaged Middling minus in grade and $1\frac{1}{2}$ inches in length of staple, whereas Middling $1\frac{1}{2}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill D.

EXPLANATION OF DIFFERENCES IN COSTS, MILL D VS. MODEL MILL, 20s
WARP YARN (TABLE 53)

OVERHEAD.—The overhead cost per pound in Mill D is 0.54 cent below that of the Model mill, but without depreciation, its cost would be 1.19 cents per pound above that of the Model. The reason is that salaries in Mill D are 1.21 cents per pound higher. The cost per pound for all the other items of the overhead, except depreciation, compare favorably.

LABOR.—The total roving cost per pound in this mill is 0.79 cent higher than that of the Model mill. The costs of both mills are based on about the same hank roving and both are one process. Production per man-hour in Mill D is lower but the main reason for the higher cost is due to smaller job sizes. Spinning cost is 0.35 cent per pound above that of the Model mill, the principal reason being that the spinners in Mill D do not have so many spindles.

The winding cost per pound is 2.17 cents compared with 1.40 cents for the Model. This difference is due primarily to the direct labor in this department, as the winder tenders' cost per pound in Mill D is 0.60 cent above that of the Model mill, because of smaller job sizes.

The average hourly wage rate in Mill D is about 11.7 percent lower than in the Model, and if the cost were based on the same average hourly wage rate, it would be increased by 1.19 cents per pound.

TABLE 54.—*Mill D and Model mill: Average overhead and labor costs per pound for 30s warp cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill D	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.09	Cents 0.09	Cents 0
Labor.....	.25	.19	.06
Total.....	.34	.28	.06
Opening and picking:			
Overhead.....	.45	.64	2.19
Labor.....	.39	.36	.03
Total.....	.84	1.00	2.16
Carding:			
Overhead.....	.98	1.40	2.42
Labor.....	1.11	.95	.16
Total.....	2.09	2.35	2.26

See footnotes at end of table.

TABLE 54. —*Mill D and Model mill: Average overhead and labor costs per pound for 30s warp cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill D	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 33	0. 43	² 0. 10
Labor.....	. 58	. 49	. 09
Total.....	. 91	. 92	² 0. 01
Fly frames:			
Overhead.....	. 58	. 96	² 0. 38
Labor.....	. 95	1. 14	² 0. 19
Total.....	1. 53	2. 10	² 0. 57
Total roving cost:			
Overhead.....	2. 43	3. 52	² 1. 09
Labor.....	3. 28	3. 13	. 15
Total.....	5. 71	6. 65	² 0. 94
Spinning:			
Overhead.....	5. 05	5. 20	² 0. 15
Labor.....	5. 86	4. 28	1. 58
Total.....	10. 91	9. 48	1. 43
Winding:			
Overhead.....	. 98	. 95	. 03
Labor.....	2. 17	1. 85	. 32
Total.....	3. 15	2. 80	. 35
Packing and shipping:			
Overhead.....	. 08	. 16	² 0. 08
Labor.....	. 22	. 23	² 0. 01
Total.....	. 30	. 39	² 0. 09
Total cost:			
Overhead.....	8. 54	9. 83	² 1. 29
Labor.....	11. 53	9. 49	2. 04
Total.....	20. 07	19. 32	. 75

¹ All costs are adjusted to two shifts or 80 hours per week. Cotton used by Mill D averaged Middling minus in grade and $1\frac{1}{2}$ inches in length of staple, whereas Middling $1\frac{1}{16}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill D.

EXPLANATION OF DIFFERENCES IN COSTS, MILL D VS. MODEL MILL, 30S WARP YARN (TABLE 54)

OVERHEAD.—The total overhead cost per pound, without depreciation, is 1.09 cents higher in Mill D than in the Model mill, which is principally due to higher salaries. This mill is classified as a "small" mill, compared with "medium" size for the Model mill.

LABOR.—The total roving cost per pound is only 0.15 cent higher than in the Model.

Spinning costs are 1.58 cents per pound higher, the main reason being the lower number of pounds per spindle handled and the lower spindles per spinner than those set up in the Model mill.

The winding cost per pound is 0.32 cent higher, of which 0.24 cent is due to the fact that the winder tenders are not handling so many pounds as those set up in the Model.

The total labor cost per pound is 2.04 cents higher, and the average hourly wage rate is 13 percent lower, than in the Model mill. This difference in wage rate would amount to about 1.68 cents per pound of yarn.

TABLE 55.—*Mill D and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill D, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week Mill D
	20s warp yarn			30s warp yarn			
	Mill D	Model mill	Difference	Mill D	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 13	1. 29	² 0. 16	1. 52	1. 78	² 0. 26	3. 45
Power-----	1. 34	1. 36	² 0. 02	1. 79	1. 74	. 05	4. 06
Insurance:							
Liability-----	. 08	. 05	. 03	. 11	. 08	. 03	. 25
Other-----	. 26	. 19	. 07	. 35	. 26	. 09	. 80
Taxes, property-----	. 41	. 25	. 16	. 55	. 36	. 19	1. 24
Depreciation-----	. 44	2. 17	² 1. 73	. 59	2. 97	² 2. 38	1. 33
Fuel-----	. 01	. 09	² 0. 08	. 01	. 13	² 0. 12	. 03
Other expenses-----	. 34	. 36	² 0. 02	. 46	. 60	² 0. 14	1. 04
Salaries, etc-----	2. 35	1. 14	1. 21	3. 16	1. 91	1. 25	7. 14
Total-----	6. 36	6. 90	² 0. 54	8. 54	9. 83	² 1. 29	19. 34

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill D.

TABLE 56.—*Mill D: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	33. 77	Winding (twisting).....	101. 96
Opening and picking.....	52. 53	Twisting.....	196. 35
Carding.....	151. 58	Finished winding.....	280. 79
Drawing.....	78. 34	Packing and shipping....	29. 31
Slubbers.....	129. 81		
Spinning.....	569. 13	Total.....	1, 623. 57

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 57.—*Mill D: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Carding:			
Opener man.....	40	0. 87	34. 80
Card tenders.....	80	. 89	71. 20
Drawing tenders.....	80	. 89	71. 20
Slubber tenders.....	107	1. 03	110. 21
Fixers.....	80	1. 05	84. 00
Spinning:			
Overseer.....	80	1. 04	83. 20
Spinners.....	400	. 87	348. 00
Doffers.....	160	. 89	142. 40
Winding and twisting:			
Overseer.....	80	1. 04	83. 20
Winder tenders.....	80	. 96	76. 80
Winder tenders.....	120	. 90	108. 00
Winder tenders.....	120	. 96	115. 20
Twister tenders.....	160	. 89	142. 40
Shop and outside:			
Mechanic.....	40	1. 04	41. 60
Truck driver.....	40	. 87	34. 80
Watchman.....	40	. 87	34. 80
Watchman (week end).....	48	. 87	41. 76
Total or average.....	1, 755	. 93	1, 623. 57

TABLE 58.—*Mill D and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	20s warp yarn		30s warp yarn	
		Mill D	Model mill	Mill D	Model mill
Cotton used:					
Grade ¹		M—	M	M—	M
Staple length.....	Inch.....	1 $\frac{1}{32}$	1 $\frac{1}{32}$	1 $\frac{1}{32}$	1 $\frac{1}{16}$
Picker lap.....	Ounce.....	13. 50	14	13. 50	14
Quantity per picker week (40 hours).....	Pound.....	14, 552	9, 350	14, 552	11, 100
Card sliver.....	Grain.....	53	55	53	55
Quantity per card week (40 hours).....	Pound.....	347	368	347	368
Finisher drawing sliver.....	Grain.....	53	55	53	55
Quantity per finisher delivery week (40 hours).....	Pound.....	478	575	578	570
Slubber (first process): Hank roving.....	.....	1. 69	2. 00	1. 69	3. 00
Spinning:					
Revolutions per minute, front roll.....	.....	149	142	129	127
Twist multiplier.....	.....	4. 50	4. 50	4. 50	4. 50
Quantity per spindle (40 hours).....	Pound.....	1. 65	1. 66	. 98	1. 00

¹ Minus (—) indicates slightly lower grade.

MILL F

Mill F is in the "medium" (7,000 to 14,000 spindles) sized group compared with about 10,000 spindles indicated for Model mill. The standard weekly pay roll of \$5,217 is somewhat larger than the average for the 15 mills surveyed and substantially larger than that indicated for the Model. It spins a "medium" (4 to 12) number of counts of yarn. Data presented below as a basis for comparison relate to 10s and 20s hosiery yarns.

Total cost per pound of yarn, exclusive of discounts and selling expenses, for Mill F, averaging 53.24 cents for 10s yarn and 57.89 cents for 20s yarn, are about 6 percent and 3.4 percent, respectively, greater than those indicated for Model mills (table 59). Cotton used was higher in grade and shorter in staple, and net cotton costs averaged somewhat less, than for the Models. Total manufacturing costs—14.60 cents per pound for 10s yarn and 19.25 cents for 20s yarn—are 39 and 20 percent, respectively, higher than for Model mills. Labor and overhead costs are each higher but other costs are lower than for the Models. The weighted average hourly wage rate of about \$1. compares with rates of \$1.04 for Model mills. Production of yarn per man-hour averaged 11.68 pounds for 10s hosiery and 8.87 pounds for 20s hosiery yarns, compared with 23.08 pounds and 14.72 pounds, respectively, for the Models. Total labor costs per pound of yarn averaged 8.52 cents for 10s and 11.22 cents for 20s hosiery yarns compared with costs of 4.50 cents and 7.05 cents, respectively, for Model mills.

Detailed data on costs and related factors and explanations of the differences follow.

TABLE 59.—*Mill F: Average costs per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	10s hosiery		20s hosiery	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ² -----	53. 24	100. 0	57. 89	100. 0
Net cotton cost ³ -----	38. 64	72. 6	38. 64	66. 7
Manufacturing cost-----	14. 60	27. 4	19. 25	33. 3
Labor ⁴ -----	8. 52	16. 0	11. 22	19. 4
Overhead-----	4. 06	7. 6	5. 90	10. 2
Other-----	2. 02	3. 8	2. 13	3. 7
Taxes ⁵ -----	. 19	. 4	. 25	. 4
Vacation pay ⁶ -----	. 17	. 3	. 22	. 4
Packing materials-----	. 59	1. 1	. 59	1. 0
Freight-----	1. 07	2. 0	1. 07	1. 9

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton average Strict Middling in grade and $3\frac{1}{32}$ inch in length of staple. The price, 35.29 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.095, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.25 percent of labor cost.

⁶ Amounts to 2 percent of labor cost.

TABLE 60.—*Mill F and Model mills: Average overhead and labor cost per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill F	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 07	0. 06	0. 01
Labor-----	. 14	. 17	. 03
Total-----	. 21	. 23	. 02
Opening and picking:			
Overhead-----	. 40	. 37	. 03
Labor-----	. 43	. 24	. 19
Total-----	. 83	. 61	. 22

See footnotes at end of table.

TABLE 60.—*Mill F and Model mills: Average overhead and labor cost per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill F	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 93	1. 17	² 0. 24
Labor.....	. 99	. 62	. 37
Total.....	1. 92	1. 79	. 13
Drawing:			
Overhead.....	. 30	. 29	. 01
Labor.....	. 48	. 37	. 11
Total.....	. 78	. 66	. 12
Fly frames:			
Overhead.....	. 60	. 26	. 34
Labor.....	1. 57	. 43	1. 14
Total.....	2. 17	. 69	1. 48
Total roving cost:			
Overhead.....	2. 30	2. 15	. 15
Labor.....	3. 61	1. 83	1. 78
Total.....	5. 91	3. 98	1. 93
Spinning:			
Overhead.....	1. 08	1. 29	² . 21
Labor.....	2. 57	1. 40	1. 17
Total.....	3. 65	2. 69	. 96
Winding:			
Overhead.....	. 63	. 28	. 35
Labor.....	2. 18	1. 10	1. 08
Total.....	2. 81	1. 38	1. 43
Packing and shipping:			
Overhead.....	. 05	. 06	² . 01
Labor.....	. 16	. 17	² . 01
Total.....	. 21	. 23	² . 02
Total cost:			
Overhead.....	4. 06	3. 78	. 28
Labor.....	8. 52	4. 50	4. 02
Total.....	12. 58	8. 28	4. 30

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill F averaged Strict Middling in grade and $3\frac{1}{2}$ inch in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill F.

**EXPLANATION OF DIFFERENCES IN COSTS, MILL F vs. MODEL MILL, 10s
HOSIERY YARN (TABLE 60)**

OVERHEAD.—Overhead costs per pound of yarn in Mill F exceed those for the Model Mill by 0.28 cent. Without depreciation, these costs would exceed those for the Model by 1.09 cents. Costs of supplies and repairs are 0.19 cent per pound of yarn higher, other expenses are 0.22 cent higher, and costs of salaries are 0.47 cent higher, but costs of depreciation are 0.81 cent lower, than those indicated for the Model mill. These items account for most of the differences shown.

LABOR.—Labor costs per pound “through drawing” are higher for Mill F than for the Model mill due to smaller job sizes handled and lower production per machine hour in opening and picking, carding, and drawing. In addition, Mill F is producing a two process 1.85-hank roving on 8-inch by 4-inch frames, compared with a one process 1.00-hank roving on 10- by 5-inch frames in the Model, and this accounts for most of the difference in fly frame costs.

Production per spindle hour compares favorably with that of the Model and excess labor costs of spinning, amounting to 1.17 cents per pound, may be accounted for mainly by the spinners handling fewer spindles, doffers lifting fewer bobbins, and smaller jobs for section men, oilers and banders, roving men, etc., than those set up in the Model mill.

Labor costs of winding are 1.08 cents a pound higher than for the Model, of which 0.74 cent is accounted for by direct labor; that is, winder hands producing fewer pounds per hour. The balance of this difference is accounted for by smaller job sizes for section men, yarn men, etc.

TABLE 61.—Mill F and Model mill: Average overhead and labor cost per pound for 20s hosiery cotton yarn and differences, United States, May 1950¹

Item of cost	Cost per pound		
	Mill F	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	<i>Cents</i> 0.07	<i>Cents</i> 0.09	<i>Cents</i> ² 0.02
Labor.....	.14	.21	² .07
Total.....	.21	.30	² .09
Opening and picking:			
Overhead.....	.40	.51	² .11
Labor.....	.43	.36	.07
Total.....	.83	.87	² .04

See footnotes at end of table.

TABLE 61.—*Mill F and Model mill: Average overhead and labor cost per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill F	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 93	1. 25	² 0. 32
Labor.....	. 99	. 76	. 23
Total.....	1. 92	2. 01	² . 09
Drawing:			
Overhead.....	. 30	. 32	² . 02
Labor.....	. 48	. 33	. 15
Total.....	. 78	. 65	. 13
Fly frames:			
Overhead.....	. 75	. 59	. 16
Labor.....	1. 96	. 74	1. 22
Total.....	2. 71	1. 33	1. 38
Total roving cost:			
Overhead.....	2. 45	2. 76	² . 31
Labor.....	4. 00	2. 40	1. 60
Total.....	6. 45	5. 16	1. 29
Spinning:			
Overhead.....	2. 55	3. 22	² . 67
Labor.....	4. 12	2. 88	1. 24
Total.....	6. 67	6. 10	. 57
Winding:			
Overhead.....	. 85	. 53	. 32
Labor.....	2. 94	1. 57	1. 37
Total.....	3. 79	2. 10	1. 69
Packing and shipping:			
Overhead.....	. 05	. 13	² . 08
Labor.....	. 16	. 20	² . 04
Total.....	. 21	. 33	² . 12
Total cost:			
Overhead.....	5. 90	6. 64	² . 74
Labor.....	11. 22	7. 05	4. 17
Total.....	17. 12	13. 69	3. 43

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill F averaged Strict Middling in grade and $1\frac{1}{16}$ inch in length of staple, whereas Middling $1\frac{1}{2}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill F.

Total labor costs per pound of yarn for Mill F are 4.02 cents higher, despite the fact that average hourly wage rates are 4.16 percent lower, than those indicated for the Model mill. If the same wage rates had been used for both mills, the difference in total labor costs would have been increased by 0.37 cent per pound.

**EXPLANATION OF DIFFERENCES IN COSTS, MILL F VS. MODEL MILL, 20s
HOSIERY YARN (TABLE 61)**

OVERHEAD.—Largely as a result of a difference of 1.46 cents per pound of yarn in depreciation costs, total overhead costs for Mill F are 0.74 cent per pound lower than those indicated for the Model mill. However, the higher cost per pound for supplies and repairs, insurance, other expense, and salaries offsets a large part of the lower depreciation costs. This mill falls in the "medium" size group, the same as the Model mill.

LABOR.—The labor costs through drawing are 2.04 cents per pound, as compared to 1.66 cents in the Model mill. The principal reason for this difference is the lower production per machine hour and pounds per hour handled by the employees on the cards and drawing, compared with those set up in the Model mill.

On the fly frames, Mill F shows a cost of 1.22 cents per pound higher than the Model. The main reason for this difference is that Mill F has two processes of roving, compared with only one in the Model.

Spinning costs in this mill are 1.24 cents per pound higher than in the Model mill, and the spinners' cost accounts for 0.54 cent of this due to smaller job sizes. The balance of 0.70 cent per pound is accounted for by higher man-hours per pound produced for the other employees in this department, compared with those set up in the Model mill.

On the winding, Mill F shows a cost of 1.37 cents per pound higher than the Model, and the winder tenders' cost accounts for 1.04 cents of this due to smaller job size. The balance of 0.33 cent per pound is accounted for by smaller number of pounds handled per hour for the other employees in this department, compared with those set up in the Model mill.

Total labor costs per pound for Mill F are 4.17 cents per pound higher than for the Model. The average hourly wage rate is about 4 percent below that for the Model mill, and this difference in wage rates would amount to about 0.48 cent per pound of yarn.

TABLE 62.—*Mill F and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill F, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill F
	10s hosiery yarn			20s hosiery yarn			
	Mill F	Model mill	Difference	Mill F	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	1. 04	0. 85	0. 19	1. 51	1. 25	0. 26	6. 50
Power.....	. 70	. 64	. 06	1. 02	1. 25	² . 23	4. 40
Insurance:							
Liability.....	. 13	. 03	. 10	. 19	. 05	. 14	. 80
Other.....	. 17	. 11	. 06	. 24	. 18	. 06	1. 04
Taxes, property.....	. 15	. 15	0	. 21	. 25	² . 04	. 92
Depreciation.....	. 44	1. 25	² . 81	. 65	2. 11	² 1. 46	2. 77
Fuel.....	. 04	. 05	² . 01	. 05	. 09	² . 04	. 23
Other expenses.....	. 39	. 17	. 22	. 57	. 35	. 22	2. 46
Salaries, etc.....	1. 00	. 53	. 47	1. 46	1. 11	. 35	6. 26
Total.....	4. 06	3. 78	. 28	5. 90	6. 64	² . 74	25. 38

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Cost for Model mill larger than cost for Mill F.TABLE 63.—*Mill F: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	79. 64	Spinning.....	1, 799. 80
Opening and picking.....	241. 38	Winding.....	1, 318. 82
Carding.....	553. 78	Packing and shipping.....	91. 89
Drawing.....	267. 77		
Slubbers.....	301. 09	Total.....	5, 216. 64
Speeders.....	562. 47		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 64.—*Mill F: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Opener men	80	0. 97	77. 60
Waste man	40	. 97	38. 80
Picker tenders	80	. 97	77. 60
Card tenders	220	1. 00	220. 00
Card grinders	110	1. 05	115. 50
Strippers and oilers	110	1. 01	111. 10
Overseer and fixer	55	1. 10	60. 50
Sweepers	80	. 94	75. 20
Drawing tenders	220	1. 00	220. 00
Slubber tenders	240	1. 10	264. 00
Overseer	40	1. 10	44. 00
Speeder tenders	384	1. 12	430. 08
Roving haulers	64	. 97	62. 08
Overseer	55	1. 10	60. 50
Spinning:			
Spinners	960	. 94	902. 40
Doffers	400	. 94	376. 00
Oilers	80	1. 01	80. 80
Sweepers	80	. 94	75. 20
Section men	160	1. 01	161. 60
Roving haulers	80	. 94	75. 20
Overseers	80	1. 10	88. 00
Winding:			
Winding tenders	1, 088	. 97	1, 055. 36
Bobbin haulers	128	. 94	120. 32
Yarn haulers	64	. 97	62. 08
Overseers	64	1. 10	70. 40
Packers	96	. 94	90. 24
Shop and outside:			
Yardmen	80	. 94	75. 20
Watchmen	24	. 97	23. 28
Master mechanic	40	1. 59	63. 60
Helper	40	1. 00	40. 00
Total or average	5, 242	1. 00	5, 216. 64

TABLE 65.—*Mill F and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		20s hosiery yarn	
		Mill F	Model mill	Mill F	Model mill
Cotton used:					
Grade-----		SM	M	SM	M
Staple length-----	Inch-----	$3\frac{1}{32}$	1	$3\frac{1}{32}$	$1\frac{1}{32}$
Picker lap-----	Ounce-----	14. 5	14	14. 5	14
Quantity per picker week (40 hours)-----	Pound-----	10, 580	11, 850	10, 580	9, 600
Card sliver-----	Grain-----	65	55	65	55
Quantity per card week (40 hours)-----	Pound-----	265	368	265	368
Finisher drawing sliver-----	Grain-----	67	55	67	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	434	595	434	575
Slubber (first process):					
Hank roving-----		. 70	1. 00	. 85	2. 00
Speeder (second process):					
Hank roving-----		1. 85	-----	2. 35	-----
Spinning:					
Revolutions per minute, front roll-----		200	187	167	148
Twist multiplier-----		3. 20	3. 50	3. 66	3. 50
Quantity per spindle (40 hours)-----	Pound-----	4. 29	4. 25	1. 81	1. 70

MILL H

Mill H falls in the "medium" (7,000 to 14,000 spindles) sized group, the same as the Model mills, but the standard weekly payroll of \$5,928 is substantially larger than that indicated for the Model and considerably larger than the average for the 15 mills surveyed. It spins a "large" (more than 12) number of counts of yarn and data for 10s and 20s hosiery yarns are presented.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill H, averaging 52.76 cents for 10s yarn and 59.74 cents for 20s yarn, are more than 5 percent greater than those indicated for Model mills (table 66). The cotton used averaged lower in grade and shorter in staple and net cotton cost averaged about 7 percent less, than indicated for the Models. Total manufacturing costs, averaging 15.88 cents per pound for 10s yarn and 22.86 cents for 20s yarn, are 50 percent and 41 percent, respectively, higher than for Model mills. Most of these differences are accounted for by differences in labor costs, but overhead and other manufacturing costs for Mill H are relatively high. The weighted average hourly wage rate of \$1.13 was substantially higher, but production of yarn per man-hour averaged about 40 percent for 10s yarn and 37 percent for 20s yarn less, and labor cost per pound of yarn averaged 83 percent more for 10s and 70 percent more for 20s hosiery yarns, than for Model mills.

Detailed data on costs and related factors with explanations of the differences, follow.

TABLE 66.—*Mill H: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	Hosiery yarn		Warp yarn	
	10s	20s	10s	20s
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Total cost of yarn ²	52. 68	59. 17	52. 84	60. 30
Net cotton costs ³	36. 88	36. 88	36. 88	36. 88
Manufacturing cost	15. 80	22. 29	15. 96	23. 42
Labor ⁴	8. 24	11. 97	8. 23	12. 45
Overhead	4. 78	7. 31	4. 95	7. 94
Other	2. 78	3. 01	2. 78	3. 03
Taxes ⁵ .....	. 19	. 28	. 19	. 29
Vacation pay ⁶ .....	. 30	. 44	. 30	. 45
Packing materials	1. 19	1. 19	1. 19	1. 19
Freight	1. 10	1. 10	1. 10	1. 10
Proportion of total cost of yarn				
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Total cost of yarn ²	100. 0	100. 0	100. 0	100. 0
Net cotton cost ³	70. 0	62. 3	69. 8	61. 2
Manufacturing cost	30. 0	37. 7	30. 2	38. 8
Labor ⁴	15. 6	20. 2	15. 6	20. 6
Overhead	9. 1	12. 4	9. 2	13. 2
Other	5. 3	5. 1	5. 4	5. 0
Taxes ⁵ .....	. 4	. 5	. 4	. 5
Vacation pay ⁶ .....	. 6	. 7	. 6	. 7
Packing materials	2. 2	2. 0	2. 3	2. 0
Freight	2. 1	1. 9	2. 1	1. 8

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged Middling minus in grade and 1 inch in length of staple. The price, 33.44 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.103, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.

⁶ Amounts to 3.65 percent of labor cost.

TABLE 67.—*Mill H and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill H	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 24	0. 06	0. 18
Labor.....	. 52	. 17	. 35
Total.....	. 76	. 23	. 53
Opening and picking:			
Overhead.....	. 46	. 37	. 09
Labor.....	. 41	. 24	. 17
Total.....	. 87	. 61	. 26
Carding:			
Overhead.....	1. 13	1. 17	² . 04
Labor.....	1. 07	. 62	. 45
Total.....	2. 20	1. 79	. 41
Drawing:			
Overhead.....	. 32	. 29	. 03
Labor.....	. 41	. 37	. 04
Total.....	. 73	. 66	. 07
Fly frames:			
Overhead.....	. 47	. 26	. 21
Labor.....	. 85	. 43	. 42
Total.....	1. 32	. 69	. 63
Total roving cost:			
Overhead.....	2. 62	2. 15	. 47
Labor.....	3. 26	1. 83	1. 43
Total.....	5. 88	3. 98	1. 90
Spinning:			
Overhead.....	1. 52	1. 29	. 23
Labor.....	2. 62	1. 40	1. 22
Total.....	4. 14	2. 69	1. 45
Winding:			
Overhead.....	. 46	. 28	. 18
Labor.....	1. 91	1. 10	. 81
Total.....	2. 37	1. 38	. 99

See footnotes at end of table.

TABLE 67.—*Mill H and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill H	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 18	0. 06	0. 12
Labor-----	. 45	. 17	. 28
Total-----	. 63	. 23	. 40
Total cost:			
Overhead-----	4. 78	3. 78	1. 00
Labor-----	8. 24	4. 50	3. 74
Total-----	13. 02	8. 28	4. 74

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill H averaged Middling minus in grade and 1 inch in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill H.

EXPLANATION OF DIFFERENCES IN COSTS, MILL H vs. MODEL MILL, 10s HOSIERY YARN (TABLE 67)

OVERHEAD.—Overhead costs for Mill H totaled 0.59 cent a pound of yarn lower for depreciation, property taxes, and insurance other than liability; costs of fuel, power, liability insurance, and supplies and repairs were somewhat higher; and costs of salaries and other expenses were 0.75 cent and 0.45 cent, respectively, higher than those for the Model mill.

LABOR.—In comparison with the Model mill, the expense for shop and yard employees is higher in Mill H, and as each producing department shares in this expense, it is reflected in all of the excess labor costs. In addition, the average hourly wage in this mill is 9 percent higher than in the Model. In roving cost, there is an excess of 1.43 cents per pound, some of which is due to higher wages and some to the shop and outside labor, and the balance to smaller job sizes and lower machine productions, as this mill is making a one-process 1.20 hank roving (10- by 5-inch) for this yarn, while the Model mill is making a one-process 1.00 hank roving (10- by 5-inch).

Some of the 1.22 cents per pound difference in spinning labor costs is due to higher wage rates and to shop and yard expenses, but some is also due to lower pounds per spindle. In addition, the spinners tend fewer spindles, the doffers lift fewer bobbins, and the other employees in the spinning department have smaller job sizes than those set up in the Model mill.

In winding, about half the difference shown (0.81 cent) is due to winder hands producing less pounds per hour, and the balance is due to higher wages, greater expenses for shop and yard, and smaller job sizes for other labor around the winders.

Wages, and shop and outside expenses, also affect the packing cost in this mill, but lower pounds per man-hour is mainly responsible for the 0.28-cent difference in labor cost for this operation.

The average hourly wage rate in this mill is 9.06 percent higher than in the Model mill, so on the basis of the same average hourly rates, the present difference of 3.74 cents per pound would be reduced by 0.68 cent.

TABLE 68.—*Mill H and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill H	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.24	Cents 0.09	Cents 0.15
Labor.....	.52	.21	.31
Total.....	.76	.30	.46
Opening and picking:			
Overhead.....	.46	.51	.05
Labor.....	.41	.36	.05
Total.....	.87	.87	0
Carding:			
Overhead.....	1.13	1.25	.12
Labor.....	1.07	.76	.31
Total.....	2.20	2.01	.19
Drawing:			
Overhead.....	.32	.32	0
Labor.....	.41	.33	.08
Total.....	.73	.65	.08
Fly frames:			
Overhead.....	.66	.59	.07
Labor.....	1.18	.74	.44
Total.....	1.84	1.33	.51
Total roving cost:			
Overhead.....	2.81	2.76	.05
Labor.....	3.59	2.40	1.19
Total.....	6.40	5.16	1.24
Spinning:			
Overhead.....	3.45	3.22	.23
Labor.....	5.35	2.88	2.47
Total.....	8.80	6.10	2.70

See footnotes at end of table.

TABLE 68.—*Mill H and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill H	Model mill	Difference
Winding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 87	0. 53	0. 34
Labor.....	2. 58	1. 57	1. 01
Total.....	3. 45	2. 10	1. 35
Packing and shipping:			
Overhead.....	. 18	. 13	. 05
Labor.....	. 45	. 20	. 25
Total.....	. 63	. 33	. 30
Total cost:			
Overhead.....	7. 31	6. 64	. 67
Labor.....	11. 97	7. 05	4. 92
Total.....	19. 28	13. 69	5. 59

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill H averaged Middling minus in grade and 1 inch in length of staple, whereas Middling 1½-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill H.

EXPLANATION OF DIFFERENCES IN COSTS, MILL H VS. MODEL MILL, 20S HOSEYRY YARN (TABLE 68)

OVERHEAD.—The overhead cost per pound for Mill H is 0.67 cent higher than that for the Model mill, even with a lower cost of 0.91 cent per pound for depreciation. Items of cost that offset the relatively low depreciation costs are supplies and repairs, liability insurance, other expense, and salaries.

LABOR.—The cost for handling and storage in Mill H is 0.31 cent a pound higher than for the Model mill because the outside crew is not handling as many pounds as those set up in the Model.

Carding cost is 0.31 cent per pound higher and fly frame cost is 0.44 cent higher than for the Model mill, due to smaller job sizes.

The spinning cost is 2.47 cents per pound higher than for the Model, and the spinners account for 1.06 cents of this due to smaller job sizes. The balance of 1.41 cents is accounted for by less production per man-hour for the other employees in this department, compared with those set up in the Model mill.

Winding cost is 1.01 cents per pound higher than for the Model, of which 0.32 cent is due to winder tenders having smaller job sizes. The balance of 0.69 cent is due to the smaller number of pounds handled per hour for the other employees in this department, compared with those set up in the Model mill.

The packers in this mill are not packing as many pounds as those set up in the Model mill, which accounts for most of the 0.25 cent per pound difference in labor cost for packing.

Total labor cost per pound in Mill H is 4.92 cents per pound higher than for the Model. The average hourly wage rate is about 9 percent above that for the Model mill. This difference in wages would amount to 1 cent per pound of yarn.

TABLE 69.—*Mill H and Model mill: Overhead costs per pound and differences by kinds of yarn, and cost per spindle per week of 80 hours for Mill H, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill H
	10s hosiery yarn			20s hosiery yarn			
	Mill H	Model mill	Differ- ence	Mill H	Model mill	Differ- ence	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 02	0. 85	0. 17	1. 56	1. 25	0. 31	6. 88
Power	. 67	. 64	. 03	1. 02	1. 25	2. 23	4. 54
Insurance:							
Liability	. 16	. 03	. 13	. 25	. 05	. 20	1. 11
Other	. 04	. 11	2. 07	. 07	. 18	2. 11	. 30
Taxes, property	. 10	. 15	2. 05	. 15	. 25	2. 10	. 68
Depreciation	. 78	1. 25	2. 47	1. 20	2. 11	2. 91	5. 32
Fuel	. 11	. 05	. 06	. 17	. 09	. 08	. 74
Other expenses	. 62	. 17	. 45	. 95	. 35	. 60	4. 22
Salaries, etc	1. 28	. 53	. 75	1. 94	1. 11	. 83	8. 58
Total	4. 78	3. 78	1. 00	7. 31	6. 64	. 67	32. 37

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill H.

TABLE 70.—*Mill H: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	320. 24	Winding.....	1, 365. 12
Opening and picking.....	253. 14	Warping.....	46. 50
Carding.....	653. 56	Packing and shipping.....	272. 85
Drawing.....	250. 58		
Fly frames.....	624. 31	Total.....	5, 927. 73
Spinning.....	2, 141. 43		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 71.—*Mill H: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950.*

Occupation	Total hours per week	Wage rate per hour	Total pay- roll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Foreman.....	40	-----	97. 16
Second hand and fixer.....	40	1. 40	56. 00
Section men.....	80	1. 30	104. 00
Section men and oiler.....	40	1. 30	52. 00
Card grinders.....	80	1. 30	104. 00
Oiler.....	40	1. 03	41. 20
Cleaners and sweepers.....	80	. 98	78. 40
Can haulers and roving markers.....	80	. 98	78. 40
Card strippers.....	80	1. 03	82. 40
Open tenders.....	40	1. 03	41. 20
Picker tenders.....	80	1. 03	82. 40
Card tenders.....	160	1. 03	164. 80
Drawing tenders.....	160	1. 16	185. 60
Fly frame tenders.....	320	1. 177	376. 64
Spinning:			
Foreman.....	40	-----	101. 52
Second hand.....	40	1. 40	56. 00
Section men.....	80	1. 30	104. 00
Oilers and banders.....	80	1. 075	86. 00
Roving haulers.....	80	. 98	78. 40
Yarn and bobbin haulers.....	160	. 98	156. 80
Sanitary man.....	40	. 94	37. 60
Long draft cleaner.....	27	1. 075	29. 03
Spinning frame cleaner.....	27	. 98	26. 46
Sweepers.....	80	. 94	75. 20
Doffers.....	240	1. 349	323. 76
Spinners.....	920	1. 075	989. 00
Winding:			
Section men.....	80	1. 30	104. 00
Oilers and sweepers.....	80	1. 03	82. 40
Yarn haulers and inspectors.....	160	1. 03	164. 80
Winder tenders.....	880	1. 064	936. 32
Packing and shipping:			
Second hand and packer.....	40	1. 335	53. 40
Packers.....	160	1. 03	164. 80
Warper tender and packer.....	40	1. 075	43. 00
Yard:			
Foreman.....	20	-----	42. 77
Truck driver.....	40	1. 03	41. 20
Yard hands.....	160	. 94	150. 40
Yard and stencil hand.....	20	. 99	19. 80
Waste baler.....	20	1. 03	20. 60
Overhauling:			
Head overhauler.....	16	1. 43	22. 88
Overhauler.....	16	1. 40	22. 40
Overhauler helper.....	16	1. 205	19. 28
Overhauler helper and cleaner.....	16	. 98	15. 68
Watching and firing:			
Gateman.....	20	1. 01	20. 20
Watchman (week ends).....	24	1. 01	24. 24
Firemen.....	40	1. 075	43. 00
Watchman (third shift).....	20	1. 01	20. 20

TABLE 71.—*Mill H: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950—Continued*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Shop:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Foreman.....	16		46.31
Foreman, night.....	16		32.66
Shop man.....	16	1.43	22.88
Supply clerk.....	16	1.335	21.36
Supply clerk.....	16	1.075	17.20
Electrician.....	16	1.335	21.36
Electrician, helper.....	16	1.205	19.28
Carpenter.....	16	1.335	21.36
Oiler and motor cleaner.....	16	1.050	16.80
Roll coverer.....	16	1.175	18.80
Yard cleaner.....	20	.94	18.80
Scrubber.....	32	.94	30.08
Box maker.....	20	1.075	21.50
Total or average.....	5,234	1.13	5,927.73

TABLE 72.—*Mill H and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		10s warp yarn	
		Mill H	Model mill	Mill H	Model mill
Cotton used:					
Grade ¹		M—	M	M—	M
Staple length.....	Inch.....	1	1	1	1
Picker lap.....	Ounce.....	13	14	13	14
Quantity per picker week (40 hours).....	Pound.....	10,879	11,850	10,879	11,425
Card sliver.....	Grain.....	57	55	57	55
Quantity per card week (40 hours).....	Pound.....	350	368	350	368
Finished drawing sliver.....	Grain.....	60	55	60	55
Quantity per finisher delivery week (40 hours).....	Pound.....	518	595	518	595
Slubber (first process): Hank roving.....		1.20	1.00	1.80	1.00
Spinning:					
Revolutions per minute, front roll.....		180	187	179	179
Twist multiplier.....		3.00	3.50	4.50	4.50
Quantity per spindle (40 hours).....	Pound.....	3.90	4.25	3.97	4.10

See footnote at end of table.

TABLE 72.—*Mill H and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950—Continued*

Item	Unit	20s hosiery yarn		20s warp yarn	
		Mill H	Model mill	Mill H	Model mill
Cotton used:					
Grade ¹ -----		M—	M	M—	M
Staple length-----	Inch-----	1	1 $\frac{1}{32}$	1	1 $\frac{1}{32}$
Picker lap-----	Ounce-----	13	14	13	14
Quantity per picker week (40 hours)-----	Pound-----	10, 879	9, 600	10, 879	9, 350
Card sliver-----	Grain-----	57	55	57	55
Quantity per card week (40 hours)-----	Pound-----	350	368	350	368
Finished drawing sliver-----	Grain-----	60	55	60	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	518	575	518	575
Slubber (first process): Hank roving-----		1. 80	2. 00	1. 80	2. 00
Spinning:					
Revolutions per minute, front roll-----		156	148	132	142
Twist multiplier-----		3. 20	3. 50	4. 75	4. 50
Quantity per spindle (40 hours)-----	Pound-----	1. 72	1. 70	1. 49	1. 66

¹ Minus (—) indicates slightly lower grade.

MILL I

Mill I falls into the "medium" (7,000 to 14,000 spindles) sized group, the same as that for the Model mills. The standard weekly payroll of \$2,775 is substantially less than the average for the 15 mills surveyed and somewhat larger than that indicated for the Models. It spins a medium (4 to 12) number of yarn counts and data for 20s and 30s hosiery yarns are presented as a basis for comparisons with those for Model mills.

Total costs per pound of yarn, exclusive of discounts and selling expense, for Mill I, averaging 57.51 cents for 20s yarn and 61.14 cents for 30s yarn, are 2.8 percent higher for 20s, but slightly lower for 30s yarns, than those indicated for Model mills (table 73). The cotton used averaged lower in grade and shorter in staple, and net cotton costs averaged about 7 percent lower for 20s and 8 percent lower for 30s hosiery yarns, than those indicated for the Models. Total manufacturing costs, averaging 20.32 cents per pound for 20s yarn and 23.95 cents for 30s yarn, are 27 percent and 14 percent, respectively, higher than for Model mills. Most of these differences are accounted for by differences in labor costs, but overhead and other manufacturing costs are slightly higher than those for Model mills. The weighted average wage rate of 98 cents for Mill I compares with rates of about \$1.04 for the models. Production of yarn per man-hour averaged 36 percent less for 20s and 29 percent less for 30s hosiery yarns, and total labor

costs per pound of yarn averaged 48 percent greater for 20s and 30 percent greater for 30s hosiery yarns, than those indicated for Model mills.

Detailed data on costs and related factors, with explanations of the differences, follow.

TABLE 73.—*Mill I: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	20s hosiery yarn		30s hosiery yarn	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ² -----	57. 51	100. 0	61. 14	100. 0
Net cotton cost ³ -----	37. 19	64. 7	37. 19	60. 8
Manufacturing cost-----	20. 32	35. 3	23. 95	39. 2
Labor ⁴ -----	10. 44	18. 2	12. 29	20. 1
Overhead-----	7. 44	12. 9	9. 18	15. 0
Other-----	2. 44	4. 2	2. 48	4. 1
Taxes ⁵ -----	. 24	. 4	. 28	. 5
Packing materials--	1. 09	1. 9	1. 09	1. 8
Freight-----	1. 11	1. 9	1. 11	1. 8

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses are not included.

³ The cotton averaged Middling minus in grade and 1 inch plus in length of staple. The price, 33.72 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.103, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.

TABLE 74.—*Mill I and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill I	Model mill	Difference
Roving:			
Handling and storage:			
Overhead-----	<i>Cents</i> 0. 16	<i>Cents</i> 0. 09	<i>Cents</i> 0. 07
Labor-----	. 31	. 21	. 10
Total-----	. 47	. 30	. 17
Opening and picking:			
Overhead-----	. 52	. 51	. 01
Labor-----	. 35	. 36	. 01
Total-----	. 87	. 87	0

See footnotes at end of table.

TABLE 74.—*Mill I and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill I	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	1. 33	1. 25	0. 08
Labor.....	1. 05	. 76	. 29
Total.....	2. 38	2. 01	. 37
Drawing:			
Overhead.....	. 28	. 32	² . 04
Labor.....	. 38	. 33	. 05
Total.....	. 66	. 65	. 01
Fly frames:			
Overhead.....	1. 36	. 59	. 77
Labor.....	2. 54	. 74	1. 80
Total.....	3. 90	1. 33	2. 57
Total roving cost:			
Overhead.....	3. 65	2. 76	. 89
Labor.....	4. 63	2. 40	2. 23
Total.....	8. 28	5. 16	3. 12
Spinning:			
Overhead.....	2. 84	3. 22	² . 38
Labor.....	3. 43	2. 88	. 55
Total.....	6. 27	6. 10	. 17
Winding:			
Overhead.....	. 84	. 53	. 31
Labor.....	2. 12	1. 57	. 55
Total.....	2. 96	2. 10	. 86
Packing and shipping:			
Overhead.....	. 11	. 13	² . 02
Labor.....	. 26	. 20	. 06
Total.....	. 37	. 33	. 04
Total cost:			
Overhead.....	7. 44	6. 64	. 80
Labor.....	10. 44	7. 05	3. 39
Total.....	17. 88	13. 69	4. 19

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill I averaged Middling minus in grade and 1 inch plus in length of staple, whereas Middling 1½-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill I.

EXPLANATION OF DIFFERENCES IN COSTS, MILL I vs. MODEL MILL, 20s
HOSIERY YARN (TABLE 74)

OVERHEAD.—The total overhead cost for Mill I is 0.80 cent per pound higher than for the Model mill, which is principally due to 0.49 cent per pound higher cost for supplies and repairs and 1.07 cents per pound higher cost for salaries, etc. The depreciation cost is 0.66 cent per pound lower than the Model mill, which offsets some of the higher costs mentioned above.

LABOR.—Labor costs through drawing total 2.09 cents per pound, compared with 1.66 cents in the Model mill. The principal reason for this difference is the lower production per machine hour and fewer pounds per hour handled by the employees on the cards, compared with those set up in the Model mill.

On the fly frames, this mill shows a cost of 1.80 cents per pound higher than the Model. The principal reason for this difference is that this mill has two processes of roving (1.25- and 4.00-hank), as compared to only one process of roving (2.00-hank) in the Model mill.

Spinning cost is 0.55 cent per pound higher than for the Model mill, and the spinners' cost accounts for 0.29 cent of this because of the smaller job sizes handled. The balance of 0.26 cent per pound is due to the fact that the other labor in this department is not handling as many pounds per man-hour as those set up in the Model mill.

On the winding, this mill shows a cost of 0.55 cent higher than for the Model mill, and the winder tenders' cost is the principal reason for this difference due to handling fewer pounds than those set up in the Model. These hands are affected somewhat by having a smaller spinning bobbin than the Model mill.

The total labor cost for Mill I is 3.39 cents per pound higher and the average hourly wage rate is about 5.5 percent below that of the Model mill. This difference in wage rate would amount to about 0.61 cent per pound of yarn.

TABLE 75.—*Mill I and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill I	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 16	0. 08	0. 08
Labor.....	. 31	. 18	. 13
Total.....	. 47	. 26	. 21
Opening and picking:			
Overhead.....	. 52	. 60	² . 08
Labor.....	. 35	. 33	. 02
Total.....	. 87	. 93	² . 06
Carding:			
Overhead.....	1. 33	1. 30	. 03
Labor.....	1. 05	. 89	. 16
Total.....	2. 38	2. 19	. 19
Drawing:			
Overhead.....	. 28	. 40	² . 12
Labor.....	. 38	. 46	² . 08
Total.....	. 66	. 86	² . 20
Fly frames:			
Overhead.....	1. 36	. 89	. 47
Labor.....	2. 54	1. 06	1. 48
Total.....	3. 90	1. 95	1. 95
Total roving cost:			
Overhead.....	3. 65	3. 27	. 38
Labor.....	4. 63	2. 92	1. 71
Total.....	8. 28	6. 19	2. 09
Spinning:			
Overhead.....	4. 44	4. 84	² . 40
Labor.....	4. 91	4. 22	. 69
Total.....	9. 35	9. 06	. 29
Winding:			
Overhead.....	. 98	. 88	. 10
Labor.....	2. 49	2. 09	. 40
Total.....	3. 47	2. 97	. 50

See footnotes at end of table.

TABLE 75.—*Mill I and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill I	Model mill	Difference
<i>Packing and shipping:</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 11	0. 15	0. 04
Labor.....	. 26	. 21	. 05
Total.....	. 37	. 36	. 01
<i>Total cost:</i>			
Overhead.....	9. 18	9. 14	. 04
Labor.....	12. 29	9. 44	2. 85
Total.....	21. 47	18. 58	2. 89

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill I averaged Middling minus in grade and 1 inch plus in length of staple, whereas Middling 1 $\frac{1}{8}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill I.

EXPLANATION OF DIFFERENCES IN COSTS, MILL I *vs.* MODEL MILL, 30s HOSIERY YARN (TABLE 75)

OVERHEAD.—The total overhead cost per pound in Mill I is only 0.04 cent higher than that for the Model mill. This is a net difference, however, as Mill I has lower costs per pound for power, insurance, taxes, and depreciation than the Model mill by a total of 1.50 cents, but this figure is more than counterbalanced by relatively high expenses for supplies, repairs, fuel, other expense, and salaries. Salaries alone are responsible for nearly 1.00 cent a pound of the difference in overhead cost.

LABOR.—The labor cost per pound of yarn through the drawing process is only 0.23 cent higher than that for the Model mill, but whereas the Model mill uses one-process 3.00-hank roving for 30s yarn, Mill I uses two-process, 4.00-hank roving. This accounts for most of the 1.48 cents per pound difference in the labor cost for fly frames in the two mills, and the balance is accounted for by higher direct labor costs for slubber and speeder operatives due to the hank rovings in production and the number of frames in this mill.

Mill I has a spinning labor cost per pound 0.69 cent higher than that of the Model because the spinners tend less sides and the doffers lift fewer bobbins per hour. So far as labor per spindle (without spinners and doffers) is concerned, Mill I compares favorably with the Model mill.

In winding, there is a difference of 0.40 cent per pound in the labor costs for the two mills. The winder tenders in Mill I run only 50 spindles each, compared with 68 spindles per tender in the Model, and the number of pounds per machine hour in Mill I is lower than in the Model mill.

The total labor cost for this yarn in Mill I is 2.85 cents per pound higher and the average hourly wage rate is 7 percent below that for the Model mill. This variation in wage rate would account for a difference of 0.92 cent per pound of yarn.

TABLE 76.—*Mill I and Model mill: Overhead costs per pound and differences by kinds of yarn, and cost per spindle per week of 80 hours for Mill I, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill I
	20s hosiery yarn			30s hosiery yarn			
	Mill I	Model mill	Differ- ence	Mill I	Model mill	Differ- ence	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	1. 74	1. 25	0. 49	2. 16	1. 65	0. 51	5. 00
Power.....	1. 13	1. 25	2. 12	1. 39	1. 62	2. 23	3. 23
Insurance:							
Liability.....	. 06	. 05	. 01	. 07	. 07	0	. 17
Other.....	. 12	. 18	2. 06	. 14	. 25	2. 11	. 33
Taxes, property.....	. 11	. 25	2. 14	. 13	. 33	2. 20	. 31
Depreciation.....	1. 45	2. 11	2. 66	1. 80	2. 76	2. 96	4. 17
Fuel.....	. 12	. 09	. 03	. 14	. 12	. 02	. 33
Other expenses.....	. 53	. 35	. 18	. 65	. 56	. 09	1. 51
Salaries, etc.....	2. 18	1. 11	1. 07	2. 70	1. 78	. 92	6. 25
Total.....	7. 44	6. 64	. 80	9. 18	9. 14	. 04	21. 30

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill I.

TABLE 77.—*Mill I: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	74. 58	Spinning.....	1, 032. 68
Opening and picking.....	83. 63	Winding.....	560. 62
Carding.....	251. 18	Packing and shipping.....	62. 25
Drawing.....	91. 23		
Slubbers.....	190. 06	Total.....	2, 774. 84
Speeders.....	428. 61		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 78.—*Mill I: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Card grinder.....	40	1. 11	44. 40
Card room overseer.....	40	1. 11	44. 40
Opener and picker tenders.....	54	. 92	49. 68
Card tenders.....	80	. 955	76. 40
Card tender helpers.....	80	. 92	73. 60
Lapper and drawing tenders.....	80	. 975	78. 00
Slubber tenders.....	80	1. 06	84. 80
Slubber tender helpers.....	80	. 975	78. 00
Speeder tenders.....	240	1. 06	254. 40
Speeder tender helpers.....	80	. 955	76. 40
Roving haulers and sweepers.....	80	. 92	73. 60
Oiler.....	40	1. 04	41. 60
Spinning, winding, and packing:			
Overseer.....	40	1. 11	44. 40
Overseer.....	40	1. 60	64. 00
Spinners.....	640	. 92	588. 80
Doffers.....	160	. 975	156. 00
Oiler.....	80	1. 04	83. 20
Cleaners and sweepers.....	80	. 92	73. 60
Winder tenders.....	480	. 92	441. 60
Yarn men.....	80	. 97	77. 60
Yarn packers.....	54	1. 00	54. 00
Yard and outside:			
Mechanic.....	40		66. 00
Mechanic helper.....	40	1. 00	40. 00
Watchman.....	43	. 92	39. 56
Laborers.....	80	. 885	70. 80
Total or average.....	2, 831	. 98	2, 774. 84

TABLE 79.—*Mill I and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	20s hosiery yarn		30s hosiery yarn	
		Mill I	Model mill	Mill I	Model mill
Cotton used					
Grade ¹ -----		M—	M	M—	M
Staple length ² -----	Inch-----	1+	1 $\frac{1}{32}$	1+	1 $\frac{1}{16}$
Picker lap-----	Ounce-----	13. 2	14	13. 2	14
Quantity per picker week (40 hours)-----	Pound-----	9, 511	9, 600	9, 511	11, 850
Card sliver-----	Grain-----	58	55	58	55
Quantity per card week (40 hours)-----	Pound-----	266	368	266	368
Finished drawing sliver-----	Grain-----	58	55	58	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	612	575	612	570
Slubber (first process): Hank roving-----		1. 25	2. 00	1. 25	3. 00
Speeder (second process): Hank roving-----		4. 00		4. 00	
Spinning:					
Revolutions per minute, front roll-----		156	148	144	136
Twist multiplier-----		3. 25	3. 50	3. 35	3. 50
Quantity per spindle (40 hours)-----	Pound-----	1. 69	1. 70	1. 08	1. 06

¹ Minus (—) indicates slightly lower grade.

² Plus (+) indicates slightly longer staple.

MILL J

Mill J falls in the "large" (14,000 to 25,000 spindles) sized group as compared with about 10,000 spindles for the Model mills. The standard weekly pay roll of \$7,151 is about 42 percent larger than the average for the 15 mills surveyed and more than twice as large as the average for the Models. It spins a "medium" (4 to 12) number of yarn counts and data for 10s, 20s, and 30s hosiery yarns are given as a basis for comparisons with Model mills.

Total cost per pound of yarn, exclusive of discounts and selling expenses, for Mill J, of 52.03 cents for 10s yarns, 57.30 cents for 20s yarns and 63.41 cents for 30s yarns, are about 4 percent, 2.4 percent, and 3.5 percent, respectively, higher than those for Model mills (table 80). The cotton used averaged slightly higher in grade and shorter in staple, and net cotton costs averaged somewhat lower, than indicated for the Models. Total manufacturing costs, amounting to 12.88 cents per pound for 10s yarn, 18.15 cents for 20s yarn, and 24.26 cents for 30s yarn, are 22 percent, 13 percent, and 15 percent, re-

spectively, higher than those for Model mills. Labor costs are substantially greater, overhead costs are somewhat less, and other manufacturing costs are slightly greater than for the Models. Wage rates averaged considerably higher, but production of yarn per man-hour averaged less, and labor costs per pound of yarn averaged more than 60 percent greater than for the Model mills.

Detailed data on costs and related data, with explanations of the differences in costs, follow.

TABLE 80.—*Mill J: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	Hosiery yarn					
	10s		20s		30s	
	Cents 52. 03	Percent 100. 0	Cents 57. 30	Percent 100. 0	Cents 63. 41	Percent 100. 0
Total cost of yarn ² ----						
Net cotton cost ³ ----	39. 15	75. 2	39. 15	68. 3	39. 15	61. 7
Manufacturing cost-----	12. 88	24. 8	18. 15	31. 7	24. 26	38. 3
Labor ⁴ -----	7. 52	14. 5	11. 27	19. 7	15. 22	24. 0
Overhead-----	2. 87	5. 5	4. 19	7. 3	6. 14	9. 7
Other-----	2. 49	4. 8	2. 69	4. 7	2. 90	4. 6
Taxes ⁵ -----	. 17	. 3	. 26	. 5	. 35	. 6
Vacation pay ⁶ ----	. 23	. 5	. 34	. 6	. 46	. 7
Packing materials-----	1. 00	1. 9	1. 00	1. 7	1. 00	1. 6
Freight-----	1. 09	2. 1	1. 09	1. 9	1. 09	1. 7

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses are not included.

³ The cotton averaged Middling in grade and 1 inch in length of staple. The price, 35.82 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.093, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.

⁶ Amounts to 3 percent of labor cost.

TABLE 81.—*Mill J and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 06	0. 06	0
Labor.....	. 50	. 17	. 33
Total.....	. 56	. 23	. 33
Opening and picking:			
Overhead.....	. 27	. 37	. 10
Labor.....	. 29	. 24	. 05
Total.....	. 56	. 61	. 05
Carding:			
Overhead.....	. 67	1. 17	. 50
Labor.....	. 93	. 62	. 31
Total.....	1. 60	1. 79	. 19
Drawing:			
Overhead.....	. 19	. 29	. 10
Labor.....	. 44	. 37	. 07
Total.....	. 63	. 66	. 03
Fly frames:			
Overhead.....	. 28	. 26	. 02
Labor.....	. 95	. 43	. 52
Total.....	1. 23	. 69	. 54
Total roving cost:			
Overhead.....	1. 47	2. 15	. 68
Labor.....	3. 11	1. 83	1. 28
Total.....	4. 58	3. 98	. 60
Spinning:			
Overhead.....	1. 01	1. 29	. 28
Labor.....	2. 41	1. 40	1. 01
Total.....	3. 42	2. 69	. 73
Winding:			
Overhead.....	. 35	. 28	. 07
Labor.....	1. 73	1. 10	. 63
Total.....	2. 08	1. 38	. 70

See footnotes at end of table.

TABLE 81.—*Mill J and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 04	0. 06	² 0. 02
Labor.....	. 27	. 17	. 10
Total.....	. 31	. 23	. 08
Total cost:			
Overhead.....	2. 87	3. 78	2. 91
Labor.....	7. 52	4. 50	3. 02
Total.....	10. 39	8. 28	2. 11

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill J averaged Middling plus in grade and 1 inch in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill J.

EXPLANATION OF DIFFERENCES IN COSTS, MILL J VS. MODEL MILL, 10s HOSIERY YARN (TABLE 81)

OVERHEAD.—Mill J has an overhead cost per pound of 0.91 cent below that of the Model mill. Without differences in depreciation costs, it would still be 0.03 cent lower than the Model. Except for depreciation, the overhead budgets for these mills would be about equal.

LABOR.—The average hourly wage rate in Mill J is higher, and the shop and outside payroll is greater, than in the Model mill, so the effect of these two items is reflected in Mill J's excess labor costs totaling 4.22 cents per pound. Smaller job sizes and lower machine production account for the difference of 0.76 cent per pound in the labor cost through drawing. In addition, Mill J makes a 1.48-hank roving, while the Model mill makes a 1.00-hank roving (both of these rovings are made one process on 10- by 5-inch frames), which accounts for some of the difference of 0.52 cent per pound in cost on the fly frames.

Production per spindle hour is lower than in the Model mill, and in addition to the effect of higher wage rates and shop and outside expenses, the job sizes are smaller in Mill J. The latter statement refers to spinners, doffers, and other spinning room employees. These conditions are principally the reasons for the difference in cost of 1.01 cents per pound.

In direct winding labor costs, Mill J exceeds that of the Model mill by 0.31 cent; some of this difference is due to the yarn in this mill being spun on smaller rings. Of the difference of 0.63 cent per pound in the total winding labor cost between the two mills, part is due to

higher wages, part to greater expense for shop and yard, and some to smaller job sizes.

The average hourly wage rate in Mill J is 4.2 percent higher than for the Model mill. The difference of 3.02 cents per pound in total labor costs would be reduced 0.30 cent if both mills had the same average hourly wage rate.

TABLE 82.—*Mill J and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Roving:			
Handling and storage:			
Overhead-----	<i>Cents</i> 0. 06	<i>Cents</i> 0. 09	<i>Cents</i> ² 0. 03
Labor-----	. 50	. 21	. 29
Total-----	. 56	. 30	. 26
Opening and picking:			
Overhead-----	. 27	. 51	². 24
Labor-----	. 29	. 36	². 07
Total-----	. 56	. 87	². 31
Carding:			
Overhead-----	. 67	1. 25	². 58
Labor-----	. 93	. 76	. 17
Total-----	1. 60	2. 01	². 41
Drawing:			
Overhead-----	. 19	. 32	². 13
Labor-----	. 44	. 33	. 11
Total-----	. 63	. 65	². 02
Fly frames:			
Overhead-----	. 58	. 59	². 01
Labor-----	1. 47	. 74	. 73
Total-----	2. 05	1. 33	. 72
Total roving cost:			
Overhead-----	1. 77	2. 76	². 99
Labor-----	3. 63	2. 40	1. 23
Total-----	5. 40	5. 16	. 24
Spinning:			
Overhead-----	1. 92	3. 22	² 1. 30
Labor-----	4. 18	2. 88	1. 30
Total-----	6. 10	6. 10	0

See footnotes at end of table.

TABLE 82.—*Mill J and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Winding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 46	0. 53	² 0. 07
Labor.....	3. 19	1. 57	1. 62
Total.....	3. 65	2. 10	1. 55
Packing and shipping:			
Overhead.....	. 04	. 13	² 0. 09
Labor.....	. 27	. 20	. 07
Total.....	. 31	. 33	² 0. 02
Total cost:			
Overhead.....	4. 19	6. 64	² 2. 45
Labor.....	11. 27	7. 05	4. 22
Total.....	15. 46	13. 69	1. 77

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill J averaged Middling plus in grade and 1 inch in length of staple, whereas Middling 1½-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill J.

EXPLANATION OF DIFFERENCES IN COSTS, MILL J VS. MODEL MILL, 20S HOSEYRY YARN (TABLE 82)

OVERHEAD.—The total overhead cost per pound, without depreciation, in Mill J is 3.66 cents, while the similar figure for the Model mill is 4.53 cents, a difference of 0.87 cent per pound of yarn.

LABOR.—The handling and storage cost is 0.29 cent per pound higher than for the Model mill, which is due to the fact that the outside crews are not handling as many pounds as those set up for the Model.

The carding cost is 0.17 cent per pound higher than for the Model mill, and this difference is due to smaller job sizes on the cards.

On the fly frames, the cost is 0.73 cent per pound higher than for the Model, because the employees working on these frames are not handling as many pounds per man-hour, as indicated for similar employees in the Model mill.

The spinning cost per pound is 1.30 cents higher than for the Model. Smaller spinners' jobs account for 0.40 cent and the balance of 0.90 cent is due to lower pounds handled per hour for the other employees in this department, compared with those set up in the Model mill. The higher doffing cost is partially due to a smaller ring used in Mill J, compared with the Model mill.

Winding cost is 1.62 cents per pound higher than for the Model and most of this difference is due to the winder tenders not winding as many pounds as those set up in the Model mill. The size of the spinning bobbin in this mill however is smaller than that in the Model mill, which affects the pounds the tenders can handle.

The total labor cost per pound in Mill J is 4.22 cents per pound higher than for the Model mill. The average hourly wage rate is about 4.30 percent above that of the Model. This difference in wage rate would amount to about 0.46 cent per pound of yarn.

TABLE 83.—*Mill J and Model mill: Average overhead and labor cost per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.06	Cents 0.08	Cents ² 0.02
Labor.....	.50	.18	.32
Total.....	.56	.26	.30
Opening and picking:			
Overhead.....	.27	.60	² .33
Labor.....	.29	.33	² .04
Total.....	.56	.93	² .37
Carding:			
Overhead.....	.67	1.30	² .63
Labor.....	.93	.89	.04
Total.....	1.60	2.19	² .59
Drawing:			
Overhead.....	.19	.40	² .21
Labor.....	.44	.46	² .02
Total.....	.63	.86	² .23
Fly frames:			
Overhead.....	.80	.89	² .09
Labor.....	2.03	1.06	.97
Total.....	2.83	1.95	.88
Total roving cost:			
Overhead.....	1.99	3.27	² 1.28
Labor.....	4.19	2.92	1.27
Total.....	6.18	6.19	² .01

See footnotes at end of table.

TABLE 83.—*Mill J and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill J	Model mill	Difference
Spinning:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	3. 53	4. 84	² 1. 31
Labor.....	6. 73	4. 22	2. 51
Total.....	10. 26	9. 06	1. 20
Winding:			
Overhead.....	. 58	. 88	² . 30
Labor.....	4. 03	2. 09	1. 94
Total.....	4. 61	2. 97	1. 64
Packing and shipping:			
Overhead.....	. 04	. 15	² . 11
Labor.....	. 27	. 21	. 06
Total.....	. 31	. 36	² . 05
Total cost:			
Overhead.....	6. 14	9. 14	² 3. 00
Labor.....	15. 22	9. 44	5. 78
Total.....	21. 36	18. 58	2. 78

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill J averaged Middling plus in grade and 1 inch in length of staple, whereas Middling 1½-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill J.

EXPLANATION OF DIFFERENCES IN COSTS, MILL J VS. MODEL MILL, 30s HOSEYRY YARN (TABLE 83)

OVERHEAD.—Without depreciation, overhead cost for Mill J would be 5.36 cents per pound, although the similar figure for the Model mill is 6.38, a difference of 1.02 cents per pound of yarn. Costs of supplies and repairs are 0.80 cent per pound higher, but costs for power and fuel expense are 0.57 cent per pound lower, for insurance and taxes 0.33 cent lower, for other expenses 0.28 cent, and for salaries 0.64 cent lower, making a total of 1.82 cents lower, than for the Model mill.

LABOR.—Mill J is using single process roving, so the labor cost per pound, through the card room, should compare favorably with that of the Model mill. Cost per pound however, is 1.27 cents above that of the Model because the employees handling the cotton handle fewer pounds, and the frame hands do not produce as many pounds per hour, as compared to the Model. In addition, the section men, oilers, roving haulers, and sweepers costs around the fly frames are relatively high due to machine assignments and pounds per man-hour are lower than expected in the Model mill.

TABLE 84.—*Mill J and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill J, United States, May 1950*¹

Item	Cost per pound for									Cost per spindle per week, Mill J
	10s hosiery yarn			20s hosiery yarn			30s hosiery yarn			
	Mill J	Model Mill	Difference	Mill J	Model mill	Difference	Mill J	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs-----	1. 14	0. 85	0. 29	1. 67	1. 25	0. 42	2. 45	1. 65	0. 80	7. 25
Power-----	. 53	. 64	2. 11	. 77	1. 25	2. 48	1. 13	1. 62	2. 49	3. 34
Insurance:										
Liability-----	. 03	. 03	0	. 05	. 05	0	. 07	. 07	0	. 22
Other-----	. 04	. 11	2. 07	. 06	. 18	2. 12	. 08	. 25	2. 17	. 24
Taxes, property-----	. 08	. 15	2. 07	. 11	. 25	2. 14	. 17	. 33	2. 16	. 49
Depreciation-----	. 37	1. 25	2. 88	. 53	2. 11	2. 158	. 78	2. 76	2. 198	2. 31
Fuel-----	. 02	. 05	2. 03	. 03	. 09	2. 06	. 04	. 12	2. 08	. 13
Other expenses-----	. 13	. 17	2. 04	. 19	. 35	2. 16	. 28	. 56	2. 28	. 84
Salaries, etc-----	. 53	. 53	0	. 78	1. 11	2. 33	1. 14	1. 78	2. 64	3. 38
Total-----	2. 87	3. 78	2. 91	4. 19	6. 64	2 2. 45	6. 14	9. 14	2 3. 00	18. 20

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill J.

Production per 40-hour spindle is in line with Model mill in the spinning room, but the spinners tend fewer spindles and the doffers' cost is higher than in the Model, partly because of the smaller bobbin used. The bobbins lifted per 40-hour man labor are lower than for the Model mill. Labor cost per spindle (excepting spinners and doffers) is also relatively high in Mill J, as the fixers, oilers, banders, roving men, and sweepers have smaller assignments compared with the Model. Principally as a result of these conditions, the cost per pound in Mill J is 2.51 cents per pound above that of the Model mill.

This yarn is spun on a 1¼-inch ring in Mill J, so the winder tenders serve only 33 spindles each, compared with 68 spindles per tender in the Model mill; therefore, winder tenders' cost per pound is 1.66 cents per pound higher than for the Model.

The total labor cost for this yarn is 5.78 cents per pound higher and the average hourly wage rate is 2.69 percent above that of the Model mill. On the basis of the same average wage rate, the above difference would be reduced to 5.38 cents per pound, so the difference in wages accounts for 0.40 cent per pound.

TABLE 85.—*Mill J: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage----	353. 68	Spinning-----	2, 575. 43
Opening and picking----	208. 48	Winding-----	1, 983. 01
Carding-----	659. 35	Packing and shipping---	188. 70
Drawing-----	312. 66		
10- by 5-inch frames----	431. 83	Total-----	7, 151. 44
8- by 4-inch frames----	438. 30		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 86.—*Mill J: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseer.....	40		81.00
Assistant overseer.....	40	1.32	52.80
Picker tenders.....	88	1.05	92.40
Picker tender.....	40	1.10	44.00
Card tenders.....	176	1.025	180.40
	80	1.075	86.00
Card strippers.....	88	1.025	90.20
	40	1.075	43.00
Drawing tenders.....	176	1.01	177.76
	80	1.06	84.80
Waste man.....	40	1.025	41.00
Oilers.....	88	1.025	90.20
Card grinders.....	88	1.26	110.88
	40	1.31	52.40
Roving haulers.....	88	1.01	88.88
Roving hauler.....	40	1.06	42.40
Sweeper.....	88	.94	82.72
Section man.....	48	1.26	60.48
Tenders:			
10-inch by 5-inch.....	160	1.125	180.00
10-inch by 5-inch.....	80	1.173	93.84
8-inch by 4-inch.....	160	1.125	180.00
8-inch by 4-inch.....	80	1.173	93.84
Spinning:			
Overseer.....	40		81.00
Assistant overseer.....	40	1.47	58.80
Second hand.....	40	1.32	52.80
Fixers.....	160	1.26	201.60
Oilers and banders.....	80	1.05	84.00
Roving haulers.....	80	1.01	80.80
Sweepers.....	80	.94	75.20
Cleaners.....	80	.97	77.60
Doffers.....	480	1.148	551.04
Spinners.....	1,120	1.05	1,176.00
Winding and packing:			
Fixers.....	80	1.26	100.80
Inspectors.....	80	1.025	82.00
Yarn men.....	80	1.010	80.80
Box maker.....	40	1.01	40.40
Packers.....	160	1.01	161.60
Winder tenders.....	1,600	1.01	1,616.00
Shop and outside:			
Master mechanic.....	40		81.00
Mechanics.....	80	1.26	100.80
Electrician and plumber.....	40	1.27	50.80
Carpenter.....	40	1.155	46.20
Yard men.....	240	.94	225.60
Watchmen.....	80	.97	77.60
Total or average.....	6,608	1.08	7,151.44

TABLE 87.—*Mill J and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		20s hosiery yarn		30s hosiery yarn	
		Mill J	Model mill	Mill J	Model mill	Mill J	Model mill
Cotton used:							
Grade ¹		M +	M	M +	M	M +	M
Staple length.....	Inch.....	1	1	1	1½ ₂	1	1½ ₁₆
Picker lap.....	Ounce.....	12, 661	11, 850	12, 661	9, 600	12, 661	11, 850
Quantity per picker week (40 hours).....	Pound....	14	14	14	14	14	14
Card sliver.....	Grain.....	55	55	55	55	55	55
Quantity per card week (40 hours).....	Pound....	396	368	396	368	396	368
Finisher drawing sliver.....	Grain.....	55	55	55	55	55	55
Quantity per finisher delivery week (40 hours).....	Pound....	670	595	670	575	670	570
Slubber (1st process):							
Hank roving.....	.....	1. 48	1. 00	2. 75	2. 00	3. 25	3. 00
Spinning:							
Revolutions per minute, front roll.....	.....	182	187	187	148	148	136
Twist multiplier.....	.....	3. 15	3. 50	3. 08	3. 50	3. 28	3. 50
Quantity per spindle (40 hours).....	Pound....	3. 92	4. 25	2. 06	1. 70	1. 12	1. 06

¹ Plus (+) indicates slightly higher grade.

MILL K

Mill K falls in the "large" (14,000 to 25,000 spindles) sized group as compared with about 10,000 spindles for Model mills. The standard weekly payroll of \$8,747 is about 74 percent larger than the average for the 15 mills surveyed and is more than twice as large as that indicated for the Model for 10s yarn. It spins a "large" (more than 12) number of yarn counts and detailed data are presented for 10s, 20s, and 30s yarns.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill K, averaging 52.74 cents for 10s yarn, 57.96 cents for 20s yarn, and 63.96 cents for 30s yarn, are more than 5 percents greater for 10s and more than 3 percent greater for 20s and 30s yarns than those indicated for Model mills (table 88). The cotton used averaged slightly lower in grade, somewhat longer in staple for 10s yarn, somewhat shorter in staple for 30s yarn, and net cotton costs ranged from 0.90 cent per pound for 10s yarn to 1.63 cents for 30s yarn lower, than indicated for Model mills.

Total manufacturing costs, averaging 14.12 cents per pound for 10s yarn, 19.34 cents for 20s yarn, and 25.34 cents for 30s yarn are 33 percent, 19 percent, and 17 percent, respectively, higher than those indicated for the Model mills. Most of the relatively high manufacturing costs for Mill K are accounted for by relatively high labor costs, although overhead and other manufacturing costs are higher in most instances than those indicated for the Models. Wage rates averaged somewhat higher, but production of yarn per man-hour averaged about 42 percent less for 10s and 35 percent less for 20s and 30s yarns, and labor costs per pound averaged about 78 percent more for 10s and 58 percent more for 20s and 30s hosiery yarn than those indicated for Model mills.

Detailed data on costs and related data with explanations of the differences, follow.

TABLE 88.—*Mill K: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	Hosiery yarn			Warp yarn		
	10s	20s	30s	10s	20s	30s
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Total cost of yarn ² ---	52. 73	57. 99	63. 66	52. 74	57. 94	64. 27
Net cotton cost ³ ---	38. 62	38. 62	38. 62	38. 62	38. 62	38. 62
Manufacturing cost	14. 11	19. 37	25. 04	14. 12	19. 32	25. 65
Labor ⁴ -----	8. 02	11. 28	14. 81	7. 98	11. 15	15. 09
Overhead-----	3. 66	5. 51	7. 50	3. 71	5. 60	7. 81
Other-----	2. 43	2. 58	2. 73	2. 43	2. 57	2. 75
Taxes ⁵ -----	. 18	. 26	. 34	. 18	. 26	. 35
Vacation pay ⁶ ---	. 17	. 24	. 31	. 17	. 23	. 32
Packing materials-----	. 99	. 99	. 99	. 99	. 99	. 99
Freight-----	1. 09	1. 09	1. 09	1. 09	1. 09	1. 09
Proportion of total cost						
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Total cost of yarn ² ---	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0
Net cotton cost ³ ---	73. 2	66. 6	60. 7	73. 2	66. 7	60. 1
Manufacturing cost	26. 8	33. 4	39. 3	26. 8	33. 3	39. 9
Labor ⁴ -----	15. 2	19. 5	23. 2	15. 1	19. 2	23. 5
Overhead-----	7. 0	9. 5	11. 8	7. 1	9. 7	12. 1
Other-----	4. 6	4. 4	4. 3	4. 6	4. 4	4. 3
Taxes ⁵ -----	. 3	. 4	. 5	. 3	. 4	. 6
Vacation pay ⁶ ---	. 3	. 4	. 5	. 3	. 4	. 5
Packing materials-----	1. 9	1. 7	1. 6	1. 9	1. 7	1. 5
Freight-----	2. 1	1. 9	1. 7	2. 1	1. 9	1. 7

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses are not included.

³ The cotton averaged Middling minus in grade and 1½ inches plus in length of staple. The price, 34.12 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.132, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.

⁶ Amounts to 2.1 percent of labor cost.

TABLE 89.—*Mill K and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 10	0. 06	0. 04
Labor.....	. 34	. 17	. 17
Total.....	. 44	. 23	. 21
Opening and picking:			
Overhead.....	. 50	. 37	. 13
Labor.....	. 49	. 24	. 25
Total.....	. 99	. 61	. 38
Carding:			
Overhead.....	. 90	1. 17	2. 27
Labor.....	1. 04	. 62	. 42
Total.....	1. 94	1. 79	. 15
Drawing:			
Overhead.....	. 22	. 29	2. 07
Labor.....	. 46	. 37	. 09
Total.....	. 68	. 66	. 02
Fly frames:			
Overhead.....	. 54	. 26	. 28
Labor.....	1. 26	. 43	. 83
Total.....	1. 80	. 69	1. 11
Total roving cost:			
Overhead.....	2. 26	2. 15	. 11
Labor.....	3. 59	1. 83	1. 76
Total.....	5. 85	3. 98	1. 87
Spinning:			
Overhead.....	1. 05	1. 29	2. 24
Labor.....	2. 47	1. 40	1. 07
Total.....	3. 52	2. 69	. 83
Winding:			
Overhead.....	. 29	. 28	. 01
Labor.....	1. 66	1. 10	. 56
Total.....	1. 95	1. 38	. 57

See footnotes at end of table.

TABLE 89.—*Mill K and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 06	0. 06	0
Labor.....	. 30	. 17	. 13
Total.....	. 36	. 23	. 13
Total cost:			
Overhead.....	3. 66	3. 78	2. 12
Labor.....	8. 02	4. 50	3. 52
Total.....	11. 68	8. 28	3. 40

¹ All costs are adjusted to two shifts or 80 hours per week. Cotton used by Mill K averaged Middling minus in grade and $1\frac{1}{2}$ inches plus in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill K.

EXPLANATION OF DIFFERENCES IN COSTS, MILL K VS. MODEL MILL, 10s HOSEYRY YARN (TABLE 89)

OVERHEAD.—Including depreciation expense, the overhead cost per pound in Mill K is 0.12 cent below that of the Model mill, but without depreciation costs, the overhead in this mill would be 0.51 cent per pound higher. Most of this difference is due to higher costs per pound for power and salaries.

LABOR.—The difference in average hourly wage rate between these two mills is small, but a greater shop and outside payroll in Mill K is partly responsible for the excess labor cost. The cost for processes through drawing is higher by nearly a cent a pound than that for the Model mill; this is mostly due to smaller job sizes and lower productions for Mill K. This mill also uses a 1.40-hank roving, two-process, on 9- by $4\frac{1}{2}$ -inch frames, while the Model mill makes 1.00-hank roving, one-process, on 10- by 5-inch frames, which is principally responsible for the difference of 0.83 cent per pound in cost on the fly flames.

The production per spindle hour is lower than in the Model mill; and smaller job sizes for spinners, doffers, and other spinning-room employees are principally responsible for the difference of 1.07 cents per pound in the spinning labor for the two mills.

There is a difference of only 0.20 cent in cost per pound of yarn for winder tenders in these two mills, so the remainder of the total difference of 0.56 cent per pound in total winding labor is due to the small difference in average hourly wage rate, the effect of the greater expense for shop and yard, and smaller job sizes for other employees working around the winders.

If both of these mills were on the same average hourly wage rate, the present difference in total labor costs of 3.52 cents per pound would be reduced by only 0.21 cent.

TABLE 90.—*Mill K and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 10	0. 09	0. 01
Labor.....	. 34	. 21	. 13
Total.....	. 44	. 30	. 14
Opening and picking:			
Overhead.....	. 50	. 51	. 01
Labor.....	. 49	. 36	. 13
Total.....	. 99	. 87	. 12
Carding:			
Overhead.....	. 90	1. 25	. 35
Labor.....	1. 04	. 76	. 28
Total.....	1. 94	2. 01	. 07
Drawing:			
Overhead.....	. 22	. 32	. 10
Labor.....	. 46	. 33	. 13
Total.....	. 68	. 65	. 03
Fly frames:			
Overhead.....	. 71	. 59	. 12
Labor.....	1. 45	. 74	. 71
Total.....	2. 16	1. 33	. 83
Total roving cost:			
Overhead.....	2. 43	2. 76	. 33
Labor.....	3. 78	2. 40	1. 38
Total.....	6. 21	5. 16	1. 05
Spinning:			
Overhead.....	2. 36	3. 22	. 86
Labor.....	4. 56	2. 88	1. 68
Total.....	6. 92	6. 10	. 82
Winding:			
Overhead.....	. 66	. 53	. 13
Labor.....	2. 64	1. 57	1. 07
Total.....	3. 30	2. 10	1. 20

See footnotes at end of table.

Table 90.—*Mill K and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 06	0. 13	² 0. 07
Labor-----	. 30	. 20	. 10
Total-----	. 36	. 33	. 03
Total cost:			
Overhead-----	5. 51	6. 64	² 1. 13
Labor-----	11. 28	7. 05	4. 23
Total-----	16. 79	13. 69	3. 10

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill K averaged Middling minus in grade and $1\frac{1}{2}$ inches plus in length of staple, whereas Middling $1\frac{1}{2}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill K.

EXPLANATION OF DIFFERENCES IN COSTS, MILL K VS. MODEL MILL, 20s HOSEYRY YARN (TABLE 90)

OVERHEAD.—Without depreciation, the overhead cost per pound in Mill K would be 4.58 cents and in the Model mill it would be 4.53 cents, which compares favorably. Due to new building, new machinery, etc., in the Model mill, the depreciation costs total 1.18 cents per pound more than for Mill K.

LABOR.—The labor cost through drawing in this mill is 2.33 cents per pound, compared with 1.66 cents in the Model mill, and the principal reason for this difference is due to higher man-hours, for the pounds produced, for the employees in this mill, compared with the set-up in the Model mill.

The fly frame cost is 0.71 cent per pound higher than in the Model. This is principally due to the fact that Mill K has two processes of roving, compared with one process in the Model mill.

Spinning cost per pound is 1.68 cents higher than in the Model mill; 0.70 cent of this is due to spinners having smaller job sizes. The balance of 0.98 cent is due to higher man-hours, for the pounds produced, for the other employees in this department, compared with those set up in the Model mill.

Winding costs are 1.07 cents per pound higher than the Model, and 0.29 cent of this is due to the winder tenders having a smaller job size. The balance of 0.78 cent is due to other employees having smaller job assignments than those set up for similar employees in the Model mill.

The total labor cost is 4.23 cents per pound higher and the average hourly wage rate is about 2.8 percent higher than in the Model mill. This difference in wage rate would amount to about 0.31 cent per pound of yarn.

TABLE 91.—*Mill K and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 10	0. 08	0. 02
Labor.....	. 34	. 18	. 16
Total.....	. 44	. 26	. 18
Opening and picking:			
Overhead.....	. 50	. 60	² . 10
Labor.....	. 49	. 33	. 16
Total.....	. 99	. 93	. 06
Carding:			
Overhead.....	1. 05	1. 30	² . 25
Labor.....	1. 23	. 89	. 34
Total.....	2. 28	2. 19	. 09
Drawing:			
Overhead.....	. 30	. 40	² . 10
Labor.....	. 64	. 46	. 18
Total.....	. 94	. 86	. 08
Fly frames:			
Overhead.....	. 96	. 89	. 07
Labor.....	2. 44	1. 06	1. 38
Total.....	3. 40	1. 95	1. 45
Total roving cost:			
Overhead.....	2. 91	3. 27	² . 36
Labor.....	5. 14	2. 92	2. 22
Total.....	8. 05	6. 19	1. 86
Spinning:			
Overhead.....	3. 71	4. 84	² 1. 13
Labor.....	6. 47	4. 22	2. 25
Total.....	10. 18	9. 06	1. 12
Winding:			
Overhead.....	. 82	. 88	² . 06
Labor.....	2. 90	2. 09	. 81
Total.....	3. 72	2. 97	. 75

See footnotes at end of table.

TABLE 91.—*Mill K and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill K	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 06	0. 15	² 0. 09
Labor.....	. 30	. 21	0. 09
Total.....	. 36	. 36	0
Total cost:			
Overhead.....	7. 50	9. 14	² 1. 64
Labor.....	14. 81	9. 44	5. 37
Total.....	22. 31	18. 58	3. 73

¹ All costs are adjusted to two shifts or 80 hours per week. Cotton used by Mill K averaged Middling minus in grade and $1\frac{1}{32}$ inches plus in length of staple, whereas Middling $1\frac{1}{16}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill K.

EXPLANATION OF DIFFERENCES IN COSTS, MILL K VS. MODEL MILL, 30s HOSEYRY YARN (TABLE 91)

OVERHEAD.—Without depreciation, the overhead cost per pound in Mill K is 6.24 cents, and in the Model mill it is 6.38 cents. Except that the Model mill, with new buildings, machinery, and equipment, has a higher cost for depreciation, the mills have very nearly the same total overhead costs.

LABOR.—Mill K uses a 3.50 hank roving for this yarn, and it is made in two processes in the card room. This accounts for most of the 2.22 cents per pound difference in labor cost for roving in the two mills, but actually the labor cost per pound is higher for Mill K than for the Model in all the processes in the card room because of smaller job sizes and lower machine productions.

In the spinning room the labor cost per pound is 6.47 cents, while in the Model mill it is 4.22 cents. This difference is not due to spindle production, but to smaller job sizes. The spinners do not handle so many spindles, the doffers do not lift so many bobbins, and the fixers, oilers and banders, roving haulers, sweepers, etc., do not have the same job assignments as in the Model.

Winder tenders in Mill K have 75 spindles each and the yarn is spun on 2-inch rings, so their cost per pound is in line with that of the Model mill, and the difference of 0.81 cent per pound for this operation is due to different job assignments for section men, scale men, bobbin haulers, and sweepers, compared with these hands in the Model.

The average wage rate per hour is 1.2 percent higher than in the Model mill, which has little effect on the comparison of labor costs.

TABLE 92.—*Mill K and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill K, United States, May 1950*¹

Item	Cost per pound for—									Cost per spindle per week, Mill K
	10s hosiery yarn			20s hosiery yarn			30s hosiery yarn			
	Mill K	Model mill	Difference	Mill K	Model mill	Difference	Mill K	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	0. 76	0. 85	² 0. 09	1. 14	1. 25	² 0. 11	1. 55	1. 65	² 0. 10	3. 85
Power.....	. 82	. 64	. 18	1. 23	1. 25	² . 02	1. 68	1. 62	. 06	4. 16
Insurance:										
Liability.....	. 05	. 03	. 02	. 08	. 05	. 03	. 11	. 07	. 04	. 26
Other.....	. 11	. 11	0	. 16	. 18	² . 02	. 22	. 25	² . 03	. 53
Taxes, property.....	. 27	. 15	. 12	. 40	. 25	. 15	. 55	. 33	. 22	1. 37
Depreciation.....	. 62	1. 25	² . 63	. 93	2. 11	² 1. 18	1. 26	2. 76	² 1. 50	3. 13
Fuel.....	. 07	. 05	. 02	. 11	. 09	. 02	. 15	. 12	. 03	. 36
Other expense.....	. 04	. 17	² . 13	. 07	. 35	² . 28	. 09	. 56	² . 47	. 23
Salaries, etc.....	. 92	. 53	. 39	1. 39	1. 11	. 28	1. 89	1. 78	. 11	4. 69
Total.....	3. 66	3. 78	² . 12	5. 51	6. 64	² 1. 13	7. 50	9. 14	² 1. 64	18. 58

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill K.

TABLE 93.—*Mill K: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	277. 46	Intermediates.....	255. 97
Opening and picking.....	396. 45	Speeders.....	476. 72
Carding.....	854. 48	Spinning.....	3, 624. 23
Drawing.....	410. 08	Winding.....	1, 802. 51
12- by 6-inch slubbers.....	73. 05	Packing and shipping.....	209. 53
10- by 5-inch interdraft slubbers.....	366. 50	Total.....	8, 746. 98

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 94.—*Mill K: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Carding:			
Overseer.....	40		86. 54
Opener hands.....	120	1. 03	123. 60
Picker hands.....	120	1. 073	128. 76
Card hands.....	360	1. 03	370. 80
Drawing hands.....	240	1. 00	240. 00
Slubber hands.....	80	. 996	79. 68
Interdraft hands.....	200	1. 117	223. 40
Intermediate hands.....	160	1. 008	161. 28
Speeder hands.....	240	1. 216	291. 84
Section men.....	80	1. 307	104. 56
	120	1. 307	156. 84
Sweepers.....	80	. 94	75. 20
	80	. 94	75. 20
Strippers.....	120	1. 033	123. 96
Can haulers.....	80	. 974	77. 92
Grinders.....	120	1. 307	156. 84
Oiler.....	40	1. 033	41. 32
Roving haulers.....	80	. 974	77. 92
Transfer hands and cleaners.....	120	. 974	116. 88
Waste machine man.....	40	1. 009	40. 36

TABLE 94.—*Mill K: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950—Continued*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Spinning:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseer.....	40		86. 54
Roller shop man.....	40	1. 03	41. 20
Traveler changer.....	40	1. 033	41. 32
Blow-off men.....	80	. 974	77. 92
Spinners.....	1, 600	1. 086	1, 737. 60
Doffers.....	440	1. 085	477. 40
Section men.....	160	1. 307	209. 12
Oilers.....	80	1. 033	82. 64
Roving haulers.....	80	. 974	77. 92
Roving haulers and banders.....	80	1. 033	82. 64
Sweepers.....	120	. 940	112. 80
Brake back hands.....	160	1. 033	165. 28
Cleaners.....	80	. 974	77. 92
Oilers and banders.....	80	1. 033	82. 64
Winding:			
Winder tenders.....	1, 360	. 977	1, 328. 72
Section men.....	80	1. 307	104. 56
Scales hand.....	80	. 975	78. 00
Bobbin haulers.....	160	. 974	155. 84
Inspectors.....	80	. 974	77. 92
Sweepers.....	80	. 940	75. 20
Packers.....	120	1. 033	123. 96
Shop and outside:			
Master mechanic.....	40		86. 54
Electrician.....	40	1. 33	53. 20
Mechanic.....	40	1. 30	52. 00
Humidifier man.....	40	1. 01	40. 40
Shop helper.....	40	1. 01	40. 40
Yard men.....	280	. 94	263. 20
Tenement operator.....	40	1. 00	40. 00
Watchmen.....	80	1. 01	80. 80
Watchman (3rd shift).....	40	1. 01	40. 40
Total or average.....	8, 200	1. 07	8, 746. 98

TABLE 95.—*Mill K and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		10s warp yarn		20s hosiery yarn	
		Mill K	Model mill	Mill K	Model mill	Mill K	Model mill
Cotton used:							
Grade ¹ -----		M—	M	M—	M	M—	M
Staple length ² -----	Inch-----	1½ ₃₂ +	1	1½ ₃₂ +	1	1½ ₃₂ +	1½ ₃₂
Picker lap-----	Ounce-----	14	14	14	14	14	14
Quantity per picker week ³	Pound-----	7, 276	11, 850	7, 276	11, 425	7, 276	9, 600
Card sliver-----	Grain-----	60	55	60	55	60	55
Quantity per card week ³	Pound-----	275	368	301	368	275	368
Finisher drawing sliver-----	Grain-----	60	55	60	55	60	55
Quantity per finisher delivery week ³	Pound-----	627	595	627	595	627	575
Slubber (first process):							
Hank roving-----		. 60	1. 00	. 60	1. 00	. 60	2. 00
Speeder (second process):							
Hank roving-----		1. 40	-----	1. 40	-----	2. 00	-----
Spinning:							
Revolutions per minute, front roll-----		185	187	158	179	162	148
Twist multiplier-----		3. 30	3. 50	4. 40	4. 50	3. 30	3. 50
Quantity per spindle week ³ -----	Pound-----	3. 97	4. 25	3. 39	4. 10	1. 76	1. 70
		20s warp yarn		30s hosiery yarn		30s warp yarn	
		Mill K	Model mill	Mill K	Model mill	Mill K	Model mill
Cotton used:							
Grade ¹ -----		M—	M	M—	M	M—	M
Staple length ² -----	Inch-----	1½ ₃₂ +	1½ ₃₂	1½ ₃₂ +	1½ ₁₆	1½ ₃₂ +	1½ ₁₆
Picker lap-----	Ounce-----	14	14	14	14	14	14
Quantity per picker week ³	Pound-----	7, 276	9, 350	7, 276	11, 850	7, 276	11, 100
Card sliver-----	Grain-----	60	55	60	55	60	55
Quantity per card week ³	Pound-----	301	368	235	368	235	368
Finisher drawing sliver-----	Grain-----	60	55	60	55	60	55
Quantity per finisher delivery week ³	Pound-----	627	575	627	570	627	570
Slubber (first process):							
Hank roving-----		. 60	2. 00	1. 10	3. 00	1. 10	3. 00
Speeder (second process):							
Hank roving-----		2. 00	-----	3. 50	-----	3. 50	-----
Spinning:							
Revolutions per minute, front roll-----		143	142	151	136	126	127
Twist multiplier-----		4. 04	4. 50	3. 30	3. 50	4. 40	4. 50
Quantity per spindle week ³ -----	Pound-----	1. 55	1. 66	1. 12	1. 06	. 93	1. 00

¹ Minus (—) indicates slightly lower grade.² Plus (+) indicates slightly longer staple.³ Week of 40 hours.

MILL N

Mill N is classified as "medium" (7,000 to 14,000 spindles) in size, compared with about 10,000 spindles for the Model mill. The standard weekly pay roll of \$6,432 is more than one-fourth larger than the average for the 15 mills surveyed and about twice as large as the average specified for Models for 10s and 20s yarns. It spins a "large" (more than 12) number of yarn counts and data are given for 10s and 20s yarns.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill N, averaging 52.76 cents for 10s yarns and 59.41 cents for 20s yarns, are more than 5 percent higher than those for Model mills (table 96). The cotton used was slightly lower in grade and slightly longer in staple, and net cotton costs were somewhat lower, than indicated for the Models. Total manufacturing costs, averaging 14.31 cents per pound for 10s yarn and 20.96 cents for 20s yarn, are 35 percent and 29 percent, respectively, higher than those for Model mills. Labor costs are also substantially greater, but overhead and other manufacturing costs are less, for Mill N. Average wage rates were about the same as, but production of yarn per man-hour was about 40 percent less, and labor costs per pound of yarn averaged more than 60 percent higher than for the Models.

Detailed data on costs and related data with explanations of differences in costs, follow.

TABLE 96.—*Mill N: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	Hosiery yarn		Warp yarn	
	10s	20s	10s	20s
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Total cost of yarn ²	52. 79	59. 17	52. 73	59. 65
Net cotton cost ³	38. 45	38. 45	38. 45	38. 45
Manufacturing cost	14. 34	20. 72	14. 28	21. 20
Labor ⁴	7. 50	11. 27	7. 45	11. 53
Overhead	4. 34	6. 73	4. 34	6. 94
Other	2. 50	2. 72	2. 49	2. 73
Taxes ⁵ .....	. 21	. 32	. 21	. 32
Vacation pay ⁶ .....	. 23	. 34	. 22	. 35
Packing materials .....	. 97	. 97	. 97	. 97
Freight	1. 09	1. 09	1. 09	1. 09

See footnotes at end of table.

TABLE 96.—*Mill N: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹—Continued

Item	Hosiery yarn		Warp yarn	
	10s	20s	10s	20s
	Proportion of total cost			
	<i>Percent</i> 100. 0	<i>Percent</i> 100. 0	<i>Percent</i> 100. 0	<i>Percent</i> 100. 0
Total cost of yarn ²				
Net cotton cost ³	72. 8	65. 0	72. 9	64. 5
Manufacturing cost.....	27. 2	35. 0	27. 1	35. 5
Labor ⁴	14. 2	19. 0	14. 1	19. 3
Overhead.....	8. 2	11. 4	8. 3	11. 6
Other.....	4. 8	4. 6	4. 7	4. 6
Taxes ⁵.....	. 4	. 5	. 4	. 6
Vacation pay ⁶.....	. 4	. 6	. 4	. 6
Packing materials.....	1. 9	1. 6	1. 8	1. 6
Freight.....	2. 1	1. 9	2. 1	1. 8

¹ All costs are adjusted to 2 shifts of 80 hours per week.² Discounts and selling expenses are not included.³ The cotton averaged Strict Low Middling plus in grade and 1½ inch plus in length of staple. The price, 34.12 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.127, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Social security and old-age benefits which account for 2.8 percent of labor cost.⁶ Amounts to 3 percent of labor cost.

TABLE 97.—*Mill N and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn, and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill N	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 13	0. 06	0. 07
Labor.....	. 36	. 17	. 19
Total.....	. 49	. 23	. 26
Opening and picking:			
Overhead.....	. 36	. 37	² . 01
Labor.....	. 26	. 24	. 02
Total.....	. 62	. 61	. 01
Carding:			
Overhead.....	. 97	1. 17	² . 20
Labor.....	. 81	. 62	. 19
Total.....	1. 78	1. 79	² . 01
Drawing:			
Overhead.....	. 24	. 29	² . 05
Labor.....	. 39	. 37	. 02
Total.....	. 63	. 66	² . 03
Fly frames:			
Overhead.....	. 49	. 26	. 23
Labor.....	. 94	. 43	. 51
Total.....	1. 43	. 69	. 74
Total roving cost:			
Overhead.....	2. 19	2. 15	. 04
Labor.....	2. 76	1. 83	. 93
Total.....	4. 95	3. 98	. 97
Spinning:			
Overhead.....	1. 42	1. 29	. 13
Labor.....	2. 62	1. 40	1. 22
Total.....	4. 04	2. 69	1. 35
Winding:			
Overhead.....	. 59	. 28	. 31
Labor.....	1. 69	1. 10	. 59
Total.....	2. 28	1. 38	. 90

See footnote at end of table.

CARDED COTTON YARN AND MEANS OF IMPORT

TABLE 97.—*Mill N and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn, and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill N	Model mill	Difference
<i>Packing and shipping:</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 14	0. 06	0. 08
Labor.....	. 43	. 17	. 26
Total.....	. 57	. 23	. 34
<i>Total cost:</i>			
Overhead.....	4. 34	3. 78	. 56
Labor.....	7. 50	4. 50	3. 00
Total.....	11. 84	8. 28	3. 56

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill N averaged Strict Low Middling plus in grade and 1½ inches plus in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill N.

EXPLANATION OF DIFFERENCES IN COSTS, MILL N VS. MODEL MILL, 10S HOSEY YARN (TABLE 97)

OVERHEAD.—The overhead cost is 0.56 cent per pound higher than that for the Model mill even though the Model overhead cost includes 1.25 cents per pound for depreciation, compared with 0.48 cent per pound for Mill N. Aside from this item, Mill N is higher by 0.23 cent for supplies and repairs, and by 1.14 cents on salaries.

LABOR.—There is practically no difference in the average hourly wage rate for these two mills, but Mill N has a greater shop and outside payroll, which is partially responsible for the excess labor cost per pound. This fact is especially true in the card-room preparatory processes and to some extent in the fly-frame labor cost. This mill produces a 1.50-hank roving (10- by 5-inch), one-process, while the Model mill uses 1.00-hank roving (10- by 5-inch), one-process, and the latter mill has the lower labor cost. Total roving cost is 0.93 cent per pound above that of the Model mill, and the above described differences contribute to some extent to this difference.

Smaller job sizes for spinners, doffers, and other spinning employees account for part of the 1.22 cents per pound excess labor cost in the spinning, but lower production per spindle hour and more expense for shop and outside labor are also included.

In the winding, the difference in labor cost between the two mills is 0.59 cent, but the winder tenders are responsible for only 0.15 cent, so the rest of this amount is due to smaller job sizes for other employees around the winding and to the higher cost for shop and outside labor.

TABLE 98.—*Mill N and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill N	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 13	0. 09	0. 04
Labor.....	. 36	. 21	. 15
Total.....	. 49	. 30	. 19
Opening and picking:			
Overhead.....	. 36	. 51	² . 15
Labor.....	. 26	. 36	² . 10
Total.....	. 62	. 87	² . 25
Carding:			
Overhead.....	. 97	1. 25	² . 28
Labor.....	. 81	. 76	. 05
Total.....	1. 78	2. 01	² . 23
Drawing:			
Overhead.....	. 24	. 32	² . 08
Labor.....	. 39	. 33	. 06
Total.....	. 63	. 65	² . 02
Fly frames:			
Overhead.....	. 79	. 59	. 20
Labor.....	1. 33	. 74	. 59
Total.....	2. 12	1. 33	. 79
Total roving cost			
Overhead.....	2. 49	2. 76	² . 27
Labor.....	3. 15	2. 40	. 75
Total.....	5. 64	5. 16	. 48
Spinning:			
Overhead.....	3. 34	3. 22	. 12
Labor.....	5. 50	2. 88	2. 62
Total.....	8. 84	6. 10	2. 74
Winding:			
Overhead.....	. 76	. 53	. 23
Labor.....	2. 19	1. 57	. 62
Total.....	2. 95	2. 10	. 85

See footnote at end of table.

TABLE 98.—*Mill N and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill N	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 14	0. 13	0. 01
Labor.....	. 43	. 20	. 23
Total.....	. 57	. 33	. 24
Total costs:			
Overhead.....	6. 73	6. 64	. 09
Labor.....	11. 27	7. 05	4. 22
Total.....	18. 00	13. 69	4. 31

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill N averaged Strict Low Middling plus in grade and $1\frac{1}{2}$ inches plus in length of staple, whereas Middling $1\frac{1}{2}$ inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill N.

EXPLANATION OF DIFFERENCES IN COSTS, MILL N VS. MODEL MILL, 20S HOSEYRY YARN (TABLE 98)

OVERHEAD.—The total overhead cost per pound, without depreciation, amounts to 5.98 cents in Mill N, as compared to 4.53 cents in the Model mill. The principal reason for this difference is the higher expense of salaries. Because of new buildings and new machinery in the Model mill, the depreciation amounts to 1.36 cents per pound more than for Mill N, which shows, as a net result, that this mill is only 0.09 cent per pound above the Model mill.

LABOR.—The total labor cost through drawing is 1.82 cents per pound, compared with 1.66 cents in the Model mill. The fly-frame cost is 0.59 cent per pound higher than for the Model. Mill N has only one process of roving, and as it produces approximately the same hank roving as the Model mill, the difference in cost of 0.59 cent per pound is caused by the smaller job sizes that these hands have compared with those set up in the Model mill.

Spinning cost per pound is 2.62 cents higher than the Model; 1.18 cents of this is due to the spinners having smaller job sizes. The remainder of 1.44 cents is due to higher man-hours, for the pounds produced, for the other employees in this department, compared with the Model mill.

The winding cost is 0.62 cent per pound higher than in the Model. The difference is principally due to the fact that the indirect labor, such as yarn dumpers, checkers, and sweepers are not handling so many pounds as those set up in the Model mill.

The packing and shipping cost is 0.23 cent per pound higher than for the Model, which means that the packers are not packing as many pounds per hour as those set up in the Model mill.

The total labor cost per pound in Mill N is 4.22 cents a pound higher than that for the Model mill. The average hourly wage rate is about the same as in the Model.

TABLE 99.—*Mill N and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill N, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill N
	10s hosiery yarn			20s hosiery yarn			
	Mill N	Model mill	Differ- ence	Mill N	Model mill	Differ- ence	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 08	0. 85	0. 23	1. 68	1. 25	0. 43	7. 10
Power-----	. 51	. 64	². 13	. 80	1. 25	². 45	3. 36
Insurance:							
Liability-----	. 05	. 03	. 02	. 07	. 05	. 02	. 30
Other-----	. 09	. 11	². 02	. 14	. 18	². 04	. 59
Taxes, property	. 25	. 15	. 10	. 39	. 25	. 14	1. 65
Depreciation-----	. 48	1. 25	². 77	. 75	2. 11	² 1. 36	3. 15
Fuel-----	. 04	. 05	². 01	. 07	. 09	². 02	. 28
Other expenses	. 17	. 17	0	. 27	. 35	². 08	1. 15
Salaries, etc-----	1. 67	. 53	1. 14	2. 56	1. 11	1. 45	10. 84
Total-----	4. 34	3. 78	. 56	6. 73	6. 64	. 09	28. 42

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill N.

TABLE 100.—*Mill N: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage	206. 50	Winding	1, 486. 16
Opening and picking	150. 44	Twisting	430. 55
Carding	462. 60	Process A ²	417. 32
Drawing	219. 49	Process B ²	360. 75
10- by 5-inch frames	403. 80	Packing and shipping	157. 82
8- by 4-inch frames	209. 23		
Spinning	1, 927. 43	Total	6, 432. 09

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

² These processes were unnamed to avoid revealing the identity of the mill.

TABLE 101.—*Mill N: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total pay- roll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseers.....	80		143. 00
Picker tenders.....	80	0. 96	76. 80
Cotton trucker.....	27	. 82	22. 14
Waste men.....	80	. 82	65. 60
Card hands.....	160	. 96	153. 60
Oiler.....	40	. 82	32. 80
Grinders.....	80	1. 07	85. 60
Drawing tenders.....	160	1. 00	160. 00
10- by 5-inch tenders.....	160	1. 26	201. 60
8- by 4-inch tenders.....	80	1. 26	100. 80
Creelers.....	80	. 82	65. 60
Fixers.....	80	. 96	76. 80
Bobbin men.....	80	. 865	69. 20
Week-end cleaning.....			35. 00
Spinning:			
Overseers.....	80		134. 35
Second hands.....	80	1. 005	80. 40
Roving haulers.....	80	. 92	73. 60
Roll pickers.....	80	. 79	63. 20
Oilers and banders.....	80	. 865	69. 20
Sweepers.....	160	. 680	108. 80
Spinners.....	960	. 935	897. 60
Doffers.....	240	1. 35	324. 00
Cleaning.....			50. 00
Winding:			
Overseers.....	80		133. 25
Second hands.....	80	1. 005	80. 40
Yarn dumpers.....	160	. 92	147. 20
Yarn checkers.....	80	. 92	73. 60
Sweepers.....	80	. 68	54. 40
Tangle yarn hand.....	40	. 71	28. 40
Winder tenders.....	1, 120	. 90	1, 008. 00
	160	. 90	144. 00
Twisting:			
Overseers.....	80		88. 88
Twister tenders.....	106	. 94	99. 64
Creelers.....	53	. 905	47. 97
Doffers.....	159	. 905	143. 90
Process A:			
Quality control man.....	40		75. 00
Machine tenders.....	106	1. 40	148. 40
Packers.....	53	1. 40	74. 20
Shippers.....	53	. 963	51. 04
Labeler.....	27	1. 10	29. 70
Process B:			
Machine operators.....	53	1. 085	57. 51
Machine helpers.....	106	. 85	90. 10
Packing and shipping:			
Shipping clerk.....	40		72. 55
Packers.....	80	1. 00	80. 00

TABLE 101.—*Mill N: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950—Continued*

Occupation	Total hours per week	Wage rate per hour	Total pay- roll per week
Shop and outside:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Master mechanic.....	40		102. 39
Mechanics.....	120	1. 202	144. 24
Electrician.....	27	1. 165	31. 46
Carpenter.....	27	1. 165	31. 46
Watchmen.....	80	. 79	63. 20
Watchman.....	8	1. 185	9. 48
Shop helpers.....	53	. 79	41. 87
Outside hands.....	53	. 735	38. 96
Janitor.....	30	. 68	20. 40
Stockroom man.....	40	. 92	36. 80
Cotton classer.....	40		94. 00
Total or average.....	6, 221	1. 03	6, 432. 09

TABLE 102.—*Mill N and Model mill: Operating data and draft program, by kinds of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		10s warp yarn	
		Mill N	Model mill	Mill N	Model mill
Cotton used:					
Grade ¹		SLM+	M	SLM+	M
Staple length ²	Inch.....	1½ ⁺	1	1½ ⁺	1
Picker lap.....	Ounce.....	14	14	14	14
Quantity per picker week (40 hours).....	Pound.....	10, 165	11, 850	10, 165	11, 425
Card sliver.....	Grain.....	55	55	55	55
Quantity per card week (40 hours).....	Pound.....	363	368	363	368
Finished drawing sliver.....	Grain.....	55	55	55	55
Quantity per finisher delivery week (40 hours).....	Pound.....	727	595	727	595
Slubber (first process):					
Hank roving.....		1. 50	1. 00	1. 50	1. 00
Spinning:					
Revolutions per minute, front roll.....		180	187	180	179
Twist multiplier.....		3. 21	3. 50	4. 22	4. 50
Quantity per spindle (40 hours).....	Pound.....	3. 87	4. 25	3. 87	4. 10

See footnotes at end of table.

TABLE 102.—*Mill N and Model mill: Operating data and draft program, by kinds of carded cotton yarn, United States, May 1950—Continued*

Item	Unit	10s hosiery yarn		20s warp yarn	
		Mill N	Model mill	Mill N	Model mill
Cotton used:					
Grade ¹		SLM +	M	SLM +	M
Staple length ²	Inch.....	1½ ₃₂ +	1½ ₃₂	1½ ₃₂ +	1½ ₃₂
Picker lap.....	Ounce.....	14	14	14	14
Quantity per picker week (40 hours).....	Pound.....	10, 165	9, 600	10, 165	9, 350
Card sliver.....	Grain.....	55	55	55	55
Quantity per card week (40 hours).....	Pound.....	363	368	363	368
Finished drawing sliver.....	Grain.....	55	55	55	55
Quantity per finisher delivery week (40 hours).....	Pound.....	727	575	727	575
Slubber (first process):.....					
Hank roving.....		2. 40	2. 00	2. 40	2. 00
Spinning:					
Revolutions per minute, front roll.....		150	148	141	142
Twist multiplier.....		3. 44	3. 50	4. 35	4. 50
Quantity per spindle (40 hours).....	Pound.....	1. 65	1. 70	1. 55	1. 66

¹ Plus (+) indicates slightly higher grade.² Plus (+) indicates slightly longer staple.

MILL O

Mill O is classified as "medium" (7,000 to 14,000 spindles) in size, compared with about 10,000 spindles for Model mills. The standard weekly pay roll of \$4,490 is slightly less than the average for the 15 mills surveyed but is higher than that indicated for the Models. It spins a "medium" (4 to 12) number of yarn counts and data are presented for 20s and 30s hosiery yarns as a basis for comparisons.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill O, amounting to 57.45 cents for 20s yarn and 63.48 cents for 30s yarn, are about 3 percent higher than those for Model mills (table 103). The cotton used averaged about the same in grade and slightly shorter in staple, and net cotton costs averaged somewhat lower, than indicated for the Models. Total manufacturing costs, averaging 18.60 cents per pound for 20s yarns and 24.63 cents for 30s yarns, are 16 percent and 17 percent, respectively, higher than for Model mills. Labor costs are also substantially higher, but overhead and other manufacturing costs are less. Wage rates averaged substantially lower, but production of yarn per man-hour averaged about 38 percent less, and labor costs per pound of yarn averaged more than 45 percent higher than for Model mills.

Detailed data on costs and related data, with explanations of the differences in costs, follow.

TABLE 103.—*Mill O: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	20s hosiery yarn		30s hosiery yarn	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ² -----	57. 45	100. 0	63. 48	100. 0
Net cotton cost ³ -----	38. 85	67. 6	38. 85	61. 2
Manufacturing cost-----	18. 60	32. 4	24. 63	38. 8
Labor ⁴ -----	10. 22	17. 8	14. 06	22. 2
Overhead-----	6. 15	10. 7	8. 26	13. 0
Other-----	2. 23	3. 9	2. 31	3. 6
Taxes ⁵ -----	. 19	. 3	. 27	. 4
Packing materials-----	. 97	1. 7	. 97	1. 5
Freight-----	1. 07	1. 9	1. 07	1. 7

¹ All costs are adjusted to two shifts or 80 hours per week.² Discounts and selling expenses are not included.³ The cotton averaged Middling in grade and 1½ inches in length of staple. The price, 35.64 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.09, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Social security and old-age benefits which account for 1.9 percent of labor cost.TABLE 104.—*Mill O and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill O	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 15	0. 09	0. 06
Labor-----	. 32	. 21	. 11
Total-----	. 47	. 30	. 17
Opening and picking:			
Overhead-----	. 54	. 51	. 03
Labor-----	. 55	. 36	. 19
Total-----	1. 09	. 87	. 22

See footnotes at end of table.

TABLE 104.—*Mill O and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950—Continued*¹

Item of cost	Cost per pound		
	Mill O	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	1. 33	1. 25	0. 08
Labor.....	1. 16	. 76	. 40
Total.....	2. 49	2. 01	. 48
Drawing:			
Overhead.....	. 30	. 32	2. 02
Labor.....	. 53	. 33	. 20
Total.....	. 83	. 65	. 18
Fly frames:			
Overhead.....	. 54	. 59	2. 05
Labor.....	1. 21	. 74	. 47
Total.....	1. 75	1. 33	. 42
Total roving cost:			
Overhead.....	2. 86	2. 76	. 10
Labor.....	3. 77	2. 40	1. 37
Total.....	6. 63	5. 16	1. 47
Spinning:			
Overhead.....	2. 55	3. 22	2. 67
Labor.....	3. 82	2. 88	. 94
Total.....	6. 37	6. 10	. 27
Winding:			
Overhead.....	. 68	. 53	. 15
Labor.....	2. 46	1. 57	. 89
Total.....	3. 14	2. 10	1. 04
Packing and shipping:			
Overhead.....	. 06	. 13	2. 07
Labor.....	. 17	. 20	2. 03
Total.....	. 23	. 33	2. 10
Total cost:			
Overhead.....	6. 15	6. 64	2. 49
Labor.....	10. 22	7. 05	3. 17
Total.....	16. 37	13. 69	2. 68

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill O averaged Middling in grade and $1\frac{1}{2}$ inches in length of staple, and Middling $1\frac{1}{32}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill O.

EXPLANATION OF DIFFERENCES IN COSTS, MILL O vs. MODEL MILL, 20s
HOSIERY YARN (TABLE 104)

OVERHEAD.—The total overhead cost per pound, without depreciation, amounts to 5.07 cents, compared with 4.53 cents in the Model mill. Mill O has a little higher cost for supplies and repairs, and salaries, but by having a lower depreciation cost, the total overhead cost per pound is 0.49 cent per pound lower than the Model.

LABOR.—The total roving cost per pound is 1.37 cents higher than in the Model mill. The principal reason for this difference is that Mill O has two processes of roving, compared with one in the Model mill.

Spinning cost per pound is 0.94 cent higher than in the Model mill, and the main reason for this difference is that the indirect labor—such as section men, oilers and banders, roving haulers, and sweepers—is not handling so many pounds per hour as similar hands are in the Model.

The winding cost per pound is 0.89 cent higher than the Model mill, and 0.57 cent of this is due to winder tenders. These tenders' jobs are affected somewhat by having a smaller spinning bobbin than the Model.

The total labor cost is 3.17 cents per pound higher than that for the Model mill; the average hourly wage rate is about 8.5 percent below. This difference in wage rate would account for a difference of about 0.96 cent per pound of yarn in labor cost.

TABLE 105.—*Mill O and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill O	Model mill	Difference
Roving:			
Handling and storage:			
Overhead-----	Cents 0. 15	Cents 0. 08	Cents 0. 07
Labor-----	. 32	. 18	. 14
Total-----	. 47	. 26	. 21
Opening and picking:			
Overhead-----	. 54	. 60	. 06
Labor-----	. 55	. 33	. 22
Total-----	1. 09	. 93	. 16
Carding:			
Overhead-----	1. 33	1. 30	. 03
Labor-----	1. 16	. 89	. 27
Total-----	2. 49	2. 19	. 30

See footnotes at end of table.

TABLE 105.—*Mill O and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950—Continued*¹

Item of cost	Cost per pound		
	Mill O	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 30	0. 40	² 0. 10
Labor-----	. 53	. 46	. 07
Total-----	. 83	. 86	² . 03
Fly frames:			
Overhead-----	1. 04	. 89	. 15
Labor-----	2. 32	1. 06	1. 26
Total-----	3. 36	1. 95	1. 41
Total roving cost:			
Overhead-----	3. 36	3. 27	. 09
Labor-----	4. 88	2. 92	1. 96
Total-----	8. 24	6. 19	2. 05
Spinning:			
Overhead-----	4. 02	4. 84	² . 82
Labor-----	6. 02	4. 22	1. 80
Total-----	10. 04	9. 06	. 98
Winding:			
Overhead-----	. 82	. 88	² . 06
Labor-----	2. 99	2. 09	. 90
Total-----	3. 81	2. 97	. 84
Packing and shipping:			
Overhead-----	. 06	. 15	² . 09
Labor-----	. 17	. 21	² . 04
Total-----	. 23	. 36	² . 13
Total cost:			
Overhead-----	8. 26	9. 14	² . 88
Labor-----	14. 06	9. 44	4. 62
Total-----	22. 32	18. 58	3. 74

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill O averaged Middling in grade and $1\frac{1}{32}$ inches in length of staple, whereas Middling $1\frac{1}{16}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill O.

EXPLANATION OF DIFFERENCES IN COSTS, MILL O VS. MODEL MILL, 30S
HOSIERY YARN (TABLE 105)

OVERHEAD.—The Model mill's total overhead cost per pound is high because of a high depreciation cost on new buildings and equipment, but without depreciation, its overhead cost per pound is 0.44 cent below the similar figure for Mill O. In the latter mill, the amounts for all insurance and other expense are below the same items for the Model, but cost of supplies and repairs is higher by 0.55 cent per pound; for power it is higher by 0.17 cent, and for salaries it is higher by 0.13 cent per pound.

LABOR.—For processes through drawing, labor cost in Mill O is relatively high because of smaller job sizes and lower machine productions in the preparatory departments. In addition, this mill makes a two-process 3.85 hank roving, as compared with a single-process 3.00 hank roving in the Model mill. These differences cause Mill O's cost to be 1.96 cents per pound above that of the Model.

In the spinning room, the labor cost per pound for Mill O is 1.80 cents above that of the Model. Part of this difference occurs because spinners do not handle so many spindles; some because doffers lift fewer bobbins, and some because fixers, oilers and banders, roving men, and sweepers have smaller job loads than are set up in the Model.

Winder tenders in Mill O tend 50 spindles and in the Model they tend 68, which accounts for 0.55 cent of the total difference of 0.90 cent in the winding labor costs in the two mills. The rest of the difference is due to smaller job loads for other employees around the winders than that set up in the Model mill.

The comparison shows that the total difference in labor cost is 4.62 cents per pound of yarn. The average wage rate per hour in Mill O is 10 percent below that of the Model mill. On the basis of the same average wage rate per hour, the above difference would be increased by 1.56 cents per pound.

TABLE 106.—*Mill O and Model mill: Overhead costs per pound and differences by kinds of yarn, and cost per spindle per week of 80 hours for Mill O, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill O
	20s hosiery yarn			30s hosiery yarn			
	Mill O	Model mill	Difference	Mill O	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 64	1. 25	0. 39	2. 20	1. 65	0. 55	5. 40
Power	1. 33	1. 25	. 08	1. 79	1. 62	. 17	4. 39
Insurance:							
Liability	. 08	. 05	. 03	. 10	. 07	. 03	. 26
Other	. 06	. 18	² . 12	. 09	. 25	² . 16	. 21
Taxes, property	. 28	. 25	. 03	. 38	. 33	. 05	. 94
Depreciation	1. 08	2. 11	² 1. 03	1. 44	2. 76	² 1. 32	3. 55
Fuel	. 09	. 09	0	. 13	. 12	. 01	. 31
Other expenses	. 17	. 35	² . 18	. 22	. 56	² . 34	. 55
Salaries, etc	1. 42	1. 11	. 31	1. 91	1. 78	. 13	4. 69
Total	6. 15	6. 64	² . 49	8. 26	9. 14	² . 88	20. 30

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Cost for Model mill larger than cost for Mill O.TABLE 107.—*Mill O: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage	113. 68	Spinning	1, 763. 35
Opening and picking	192. 21	Winding	1, 021. 17
Carding	407. 44	Packing and shipping	58. 64
Drawing	186. 00	Total	4, 490. 05
10- by 5-inch slubbers	231. 82		
8- by 4-inch speeders	515. 74		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 108.—*Mill O; Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseer.....	40		75. 00
Opener hands.....	80	0. 94	75. 20
Picker tenders.....	80	. 94	75. 20
Card tenders.....	160	. 94	150. 40
Card grinder.....	40	1. 17	46. 80
Card grinder (trainee).....	40	1. 04	41. 60
Strippers and sweepers.....	80	. 62	24. 80
Drawing tenders.....	80	. 94	75. 20
Interdraft tenders.....	160	. 94	150. 40
Speeder tenders.....	160	1. 12	179. 20
Speeder fixers.....	320	1. 10	352. 00
Roving haulers and sweepers.....	80	1. 02	81. 60
Saturday cleaning.....	80	. 90	72. 00
			25. 00
Spinning:			
Overseer.....	40		75. 00
Section men.....	80	1. 02	81. 60
Oiler and bander.....	80	. 95	76. 00
Roving.....	80	. 90	72. 00
Sweepers.....	80	. 80	64. 00
Spinners.....	800	. 94	752. 00
Spinner (learner).....	40	. 75	30. 00
Doffers.....	320	. 95	304. 00
Cleaners.....	240	. 87	208. 80
Cleaning stands.....			10. 00
Buffing rolls.....			5. 00
Saturday cleaning.....			15. 00
Winding:			
Section men.....	80	1. 00	80. 00
Bobbin boys.....	80	. 80	64. 00
Sweepers.....	80	. 80	64. 00
Winder hands.....	920	. 85	782. 00
Yarn packers.....	54	. 98	52. 92
Shop and outside:			
Master mechanic.....	40		70. 00
Helper.....	40	. 87	34. 80
Yard hands.....	80	. 87	69. 60
Scrubber.....	26 $\frac{3}{4}$	. 77	20. 53
Waste baler.....	26 $\frac{3}{4}$	. 87	23. 20
Watchmen.....	88	. 80	70. 40
Yard foreman.....	40	1. 02	40. 80
Total or average.....	4, 675	. 95	4, 490. 05

TABLE 109.—*Mill O and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	20s hosiery yarn		30s hosiery yarn	
		Mill O	Model mill	Mill O	Model mill
Cotton used:					
Grade-----		M	M	M	M
Staple length-----	Inch-----	1½ ₂	1½ ₂	1½ ₂	1½ ₆
Picker lap-----	Ounce-----	13. 5	14	13. 5	14
Quantity per picker week (40 hours)-----	Pound-----	9, 363	9, 600	9, 363	11, 850
Card sliver-----	Grain-----	52	55	52	55
Quantity per card week (40 hours)-----	Pound-----	259	368	259	368
Finished drawing sliver-----	Grain-----	53	55	53	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	496	575	496	570
Slubber (first process):					
Hank roving-----		. 90	2. 00	1. 28	3. 00
Speeder (second process):					
Hank roving-----		2. 25	-----	3. 85	-----
Spinning:					
Revolutions per minute, front roll-----		162	148	152	136
Twist multiplier-----		3. 35	3. 50	3. 50	3. 50
Quantity per spindle (40 hours)-----	Pound-----	1. 78	1. 70	1. 13	1. 06

MILL R

Mill R is classified as "medium" (7,000 to 14,000 spindles) in size, as are the Model mills. The standard weekly payroll of \$5,890 is somewhat larger than the average for the 15 mills surveyed and substantially larger than indicated for the Models. It spins a "medium" (4 to 12) number of yarn counts, and data for 10s and 20s hosiery yarns are given as a basis for comparison.

Total costs per pound of yarn, exclusive of discounts and selling expenses, amounting to 52.62 cents for 10s yarns and 57.63 cents for 20s yarns, are about 5 percent more than those indicated for Model mills (table 110). The cotton used averaged lower in grade and about the same to somewhat longer in staple; net cotton costs averaged considerably lower for Mill R, than for Model mills. Total manufacturing costs, amounting to 14.38 cents per pound for 10s yarns and 19.39 cents for 20s yarns, are 36 percent and 21 percent, respectively, higher than for the Models. Labor costs are also substantially higher, overhead costs are somewhat lower, and other manufacturing costs are slightly higher for Mill R. Wage rates average about 3 percent lower, production of yarn per man-hour averages more than 50 percent less for 10s yarn and about 45 percent less for 20s yarn, and labor costs per pound of yarn average about 100 percent greater for 10s yarn and 76 percent greater for 20s yarn, than indicated for Model mills.

Detailed data on costs and related data with explanations of differences in costs, follow.

TABLE 110.—*Mill R: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	10s hosiery yarn		20s hosiery yarn	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ² -----	52. 62	100. 0	57. 63	100. 0
Net cotton cost ³ -----	38. 24	72. 7	38. 24	66. 4
Manufacturing cost-----	14. 38	27. 3	19. 39	33. 6
Labor ⁴ -----	9. 01	17. 1	12. 45	21. 6
Overhead-----	2. 83	5. 4	4. 24	7. 3
Other-----	2. 54	4. 8	2. 70	4. 7
Taxes ⁵ -----	. 24	. 4	. 33	. 6
Vacation pay ⁶ -----	. 18	. 3	. 25	. 4
Packing materials-----	1. 03	2. 0	1. 03	1. 8
Freight-----	1. 09	2. 1	1. 09	1. 9

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged Strict Low Middling plus in grade and 1½ inches in length of staple. The price, 33.99 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.125, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.65 percent of labor cost.

⁶ Amounts to 2 percent of labor cost.

TABLE 111.—*Mill R and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill R	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead-----	0. 06	0. 06	0
Labor-----	. 34	. 17	. 17
Total-----	. 40	. 23	. 17
Opening and picking:			
Overhead-----	. 29	. 37	. 08
Labor-----	. 41	. 24	. 17
Total-----	. 70	. 61	. 09
Carding:			
Overhead-----	. 73	1. 17	. 44
Labor-----	1. 06	. 62	. 44
Total-----	1. 79	1. 79	0

See footnotes at end of table.

TABLE 111.—*Mill R and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill R	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 18	0. 29	² 0. 11
Labor.....	. 35	. 37	² . 02
Total.....	. 53	. 66	² . 13
Fly frames:			
Overhead.....	. 38	. 26	. 12
Labor.....	1. 44	. 43	1. 01
Total.....	1. 82	. 69	1. 13
Total roving cost:			
Overhead.....	1. 64	2. 15	² . 51
Labor.....	3. 60	1. 83	1. 77
Total.....	5. 24	3. 98	1. 26
Spinning:			
Overhead.....	. 80	1. 29	² . 49
Labor.....	2. 53	1. 40	1. 13
Total.....	3. 33	2. 69	. 64
Winding:			
Overhead.....	. 33	. 28	. 05
Labor.....	2. 59	1. 10	1. 49
Total.....	2. 92	1. 38	1. 54
Packing and shipping:			
Overhead.....	. 06	. 06	0
Labor.....	. 29	. 17	. 12
Total.....	. 35	. 23	. 12
Total cost:			
Overhead.....	2. 83	3. 78	² . 95
Labor.....	9. 01	4. 50	4. 51
Total.....	11. 84	8. 28	3. 56

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill R averaged Strict Low Middling plus in grade and $1\frac{1}{32}$ inches in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill R.

EXPLANATION OF DIFFERENCES IN COSTS, MILL R vs. MODEL MILL, 10s
HOSIERY YARN (TABLE 111)

OVERHEAD.—The total overhead cost per pound is 0.95 cent below the comparable figure for the Model mill, and without depreciation costs per pound, it is still 0.09 cent below that of the Model.

LABOR.—The average hourly rate is below that of the Model mill, but again, shop and outside expenses are higher than in the Model and are partly responsible for excess department labor costs. In the processes through drawing, labor cost for Mill R is 0.76 cent per pound of yarn higher than for the same processes in the Model, and most of this amount is due to smaller job sizes and lower machine productions in picking and carding. In the fly frames, the excess labor cost is 1.01 cents per pound, mostly because Mill R makes a 2.20 hank roving (one process), while the Model mill makes 1.00 hank roving (one process).

In spinning, small job sizes and lower spindle productions contribute to the excess of 1.13 cents per pound in Mill R's labor cost over that of the Model mill. The expense for shop and yard is also partly responsible for this difference.

There is a difference of 1.49 cents per pound in the winding labor costs for the two mills. Part of this difference is due to bobbin size, as Mill R has a 2½-inch ring, whereas the Model mill has 2½-inch rings; part is due to the higher cost for shop and yard expense and to smaller job sizes and lower machine productions in Mill R.

The total difference in labor cost in the two mills is 4.51 cents per pound, but the average hourly wage rate is 3.13 percent lower than that of the Model. On the basis of the same average hourly wage rate, the above difference would be increased by 0.29 cent per pound.

TABLE 112.—*Mill R and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill R	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.06	Cents 0.09	Cents ² 0.03
Labor.....	.34	.21	.13
Total.....	.40	.30	.10
Opening and picking:			
Overhead.....	.29	.51	² .22
Labor.....	.41	.36	.05
Total.....	.70	.87	² .17

See footnotes at end of table.

TABLE 112.—*Mill R and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences; United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill R	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 73	1. 25	² 0. 52
Labor.....	1. 06	. 76	. 30
Total.....	1. 79	2. 10	² . 22
Drawing:			
Overhead.....	. 18	. 32	² . 14
Labor.....	. 35	. 33	. 02
Total.....	. 53	. 65	² . 12
Fly frames:			
Overhead.....	. 38	. 59	² . 21
Labor.....	1. 44	. 74	. 70
Total.....	1. 82	1. 33	. 49
Total roving cost:			
Overhead.....	1. 64	2. 76	² 1. 12
Labor.....	3. 60	2. 40	1. 20
Total.....	5. 24	5. 16	. 08
Spinning:			
Overhead.....	2. 10	3. 22	² 1. 12
Labor.....	5. 08	2. 88	2. 20
Total.....	7. 18	6. 10	1. 08
Winding:			
Overhead.....	. 44	. 53	² . 09
Labor.....	3. 48	1. 57	1. 91
Total.....	3. 92	2. 10	1. 82
Packing and shipping:			
Overhead.....	. 06	. 13	² . 07
Labor.....	. 29	. 20	. 09
Total.....	. 35	. 33	. 02
Total cost:			
Overhead.....	4. 24	6. 64	² 2. 40
Labor.....	12. 45	7. 05	5. 40
Total.....	16. 69	13. 69	3. 00

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill R averaged Strict Low Middling plus in grade and $1\frac{1}{32}$ inches in length of staple, whereas Middling $1\frac{1}{32}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill R.

**EXPLANATION OF DIFFERENCES IN COSTS, MILL R VS. MODEL MILL, 20s
HOSIERY YARN (TABLE 112)**

OVERHEAD.—The total overhead cost per pound, without depreciation, in Mill R is 0.87 cent lower than the Model mill, which is principally because of lower power and salary expense.

LABOR.—The total roving cost per pound is 1.20 cents higher than for the Model mill. As the processes and hank roving produced are practically the same for these mills, the principal reasons for the difference in cost are the lower productions per machine hour and pounds per hour handled by the employees for mill R, compared with those set up in the Model.

The spinning cost per pound is 2.20 cents per pound higher than for the Model mill; of this difference only 0.49 cent is for spinners and 0.15 cent for doffers because indirect employees, such as section men, sweepers, oilers, and roving haulers are not handling so many pounds per hour as are indicated for similar hands in the Model.

The winding cost per pound is 1.91 cents higher than in the Model mill, of which 0.88 cent is due to winder tenders having smaller job sizes than those set up in the Model. The rest of the difference is due to the fact that the indirect labor (such as section men, yarn haulers, and sweepers) are not handling so many pounds as those set up in the Model.

The total labor cost is 5.40 cents per pound of yarn higher than for the Model mill. The average hourly wage rate in this mill is about 3 percent below that for the Model mill and this difference would amount to about 0.39 cent per pound of yarn.

TABLE 113.—*Mill R and Model mill: Overhead costs per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill R, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill R
	10s hosiery yarn			20s hosiery yarn			
	Mill R	Model mill	Difference	Mill R	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	0. 97	0. 85	0. 12	1. 45	1. 25	0. 20	5. 60
Power.....	. 43	. 64	2. 21	. 65	1. 25	2. 60	2. 50
Insurance:							
Liability.....	. 12	. 03	. 09	. 19	. 05	. 14	. 72
Other.....	. 05	. 11	2. 06	. 07	. 18	2. 11	. 28
Taxes, property.....	. 12	. 15	2. 03	. 19	. 25	2. 06	. 74
Depreciation.....	. 39	1. 25	2. 86	. 58	2. 11	2 1. 53	2. 26
Fuel.....	. 03	. 05	2. 02	. 04	. 09	2. 05	. 17
Other expenses.....	. 15	. 17	2. 02	. 22	. 35	2. 13	. 85
Salaries, etc.....	. 57	. 53	. 04	. 85	1. 11	2. 26	3. 27
Total.....	2. 83	3. 78	2. 95	4. 24	6. 64	2 2. 40	16. 39

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill R.

TABLE 114.—*Mill R: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	182. 72	Winding.....	1, 622. 94
Opening and picking.....	221. 65	Process X ²	92. 05
Carding.....	574. 29	Packing and shipping.....	155. 48
Drawing.....	187. 76		
Fly frames.....	812. 62	Total.....	5, 889. 53
Spinning.....	2, 040. 02		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

² This process was unnamed to avoid revealing the identity of the mill.

TABLE 115.—*Mill R: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Carding:			
Overseer.....	48		76. 96
	46		66. 15
Cotton opener hand.....	40	0. 94	37. 60
Pick tenders.....	142	. 94	133. 48
Card tenders.....	284	. 94	266. 96
Section foremen.....	95	1. 20	114. 00
Card grinders.....	95	1. 27	120. 65
Card strippers and sweepers.....	142	. 94	133. 48
Drawing tenders.....	142	. 98	139. 27
Roving frame tenders.....	284	1. 05	299. 73
	142	1. 05	149. 87
Roving frame doffers.....	142	1. 05	149. 10
Spinning:			
Section foremen.....	80	1. 20	96. 00
Sweepers.....	80	. 94	75. 20
Oilers.....	80	. 94	75. 20
Roving haulers.....	80	9. 94	75. 20
Doffers.....	320	1. 08	347. 76
Spinners.....	880	. 94	827. 20
Cleaners.....	320	. 94	300. 80
Winding:			
Overseer.....	48		88. 40
Section foremen.....	80	1. 20	96. 00
Machine tenders.....	80	. 94	75. 20
Yarn haulers.....	160	. 94	150. 40
Yarn packers.....	80	. 94	75. 20
Sweepers.....	80	. 94	75. 20
Yarn weigher.....	40	1. 03	41. 20
Winder tenders.....	1, 360	. 98	1, 331. 10

TABLE 115.—*Mill R: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950—Continued*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Machine shop:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Machinist.....	40	1. 30	52. 00
Helper.....	40	. 94	37. 60
Watchmen.....	80	. 94	75. 20
Watchman.....	13	. 94	12. 22
Scrubber.....	40	. 75	30. 00
	40	. 94	37. 60
Outside:			
Cotton weigher.....	40	1. 20	48. 00
Truck driver.....	40	. 94	37. 60
	40	. 75	30. 00
Yard hands.....	80	. 75	60. 00
Carpenter.....	40	1. 30	52. 00
Total or average.....	5, 863	1. 00	5, 889. 53

TABLE 116.—*Mill R and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		20s hosiery yarn	
		Mill R	Model mill	Mill R	Model mill
Cotton used:					
Grade ¹		SLM+	M	SLM+	M
Staple length.....	Inch.....	1½ ₂	1	1½ ₂	1½ ₂
Picker lap.....	Ounce.....	14	14	14	14
Quantity per picker week (40 hours).....	Pounds.....	8, 138	11, 850	8, 138	9, 600
Card sliver.....	Grain.....	53	55	53	55
Quantity per card week (40 hours).....	Pound.....	283	368	283	368
Finished drawing sliver.....	Grain.....	56. 5	55	56. 5	55
Quantity per finisher delivery week (40 hours).....	Pound.....	485	595	485	575
Slubber (First process): Hank roving.....		2. 20	1. 00	2. 20	2. 00
Spinning.....					
Revolutions per minute, front roll.....		185	187	138	148
Twist multiplier.....		3. 25	3. 50	3. 00	3. 50
Quantity per spindle (40 hours).....	Pound.....	4. 06	4. 25	1. 55	1. 70

¹ Plus (+) indicates slightly higher grade.

MILL S

Mill S is a small plant with less than 7,000 spindles, compared with about 10,000 spindles indicated for Model Mills. The standard weekly pay roll of \$2,801 is about 56 percent of the average for the 15 mills surveyed and about 30 percent less than that indicated for the Model mill for 10s yarn. It spins a medium (4 to 12) number of yarn counts and data for 10s hosiery yarn are given as a basis for comparison.

Total costs per pound of yarn, exclusive of discounts and selling expenses, averaging 53.34 cents for 10s yarns, are 6 percent more than those indicated for Model mills (table 117). The cotton used was lower in grade and shorter in staple, and net cotton costs averaged 3.31 cents per pound, or about 8 percent lower than for the Models. Total manufacturing costs averaging 17.13 cents per pound for 10s yarns are 6.53 cents, or almost 62 percent greater, than for Model mills. Labor costs are substantially higher, overhead costs are somewhat less, and other manufacturing costs are slightly greater than for the Models. Wage rates averaged about 4 percent higher, production of yarn per hour of man labor averaged 58 percent less, and labor cost per pound of yarn averaged 149 percent more than indicated for the Model.

Detailed data on costs and related data with explanations of the differences in costs shown, follow.

TABLE 117.—*Mill S: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	10s hosiery yarn		10s warp yarn	
	Cents	Percent	Cents	Percent
Total cost of yarn ²	53. 09	100. 0	53. 60	100. 0
Net cotton cost ³	36. 21	68. 2	36. 21	67. 6
Manufacturing cost	16. 88	31. 8	17. 39	32. 4
Labor ⁴	11. 00	20. 7	11. 34	21. 2
Overhead	3. 36	6. 3	3. 51	6. 5
Other	2. 52	4. 8	2. 54	4. 7
Taxes ⁵ .....	. 23	. 4	. 24	. 5
Vacation pay ⁶ .....	. 22	. 4	. 23	. 4
Packing materials	1. 03	2. 0	1. 03	1. 9
Freight	1. 04	2. 0	1. 04	1. 9

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged Middling minus in grade and $1\frac{1}{8}$ inch plus in length of staple. The price, 32.24 cents per pound was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.123, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.1 percent of labor cost.

⁶ Amounts to 2 percent of labor cost.

TABLE 118.—*Mill S and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill S	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 06	0. 06	0.
Labor.....	. 25	. 17	. 08
Total.....	. 31	. 23	. 08
Opening and picking:			
Overhead.....	. 30	. 37	² . 07
Labor.....	. 54	. 24	. 30
Total.....	. 84	. 61	. 23
Carding:			
Overhead.....	. 75	1. 17	² . 42
Labor.....	1. 23	. 62	. 61
Total.....	1. 98	1. 79	. 19
Drawing:			
Overhead.....	. 29	. 29	0
Labor.....	. 97	. 37	. 60
Total.....	1. 26	. 66	. 60
Fly frame:			
Overhead.....	. 18	. 26	² . 08
Labor.....	. 59	. 43	. 16
Total.....	. 77	. 69	. 08
Total roving cost:			
Overhead.....	1. 58	2. 15	² . 57
Labor.....	3. 58	1. 83	1. 75
Total.....	5. 16	3. 98	1. 18
Spinning:			
Overhead.....	1. 17	1. 29	² . 12
Labor.....	3. 60	1. 40	2. 20
Total.....	4. 77	2. 69	2. 08
Winding:			
Overhead.....	. 52	. 28	. 24
Labor.....	3. 33	1. 10	2. 23
Total.....	3. 85	1. 38	2. 47

See footnotes at end of table.

TABLE 118.—*Mill S and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill S	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0.09	0.06	0.03
Labor.....	.49	.17	.32
Total.....	.58	.23	.35
Total cost:			
Overhead.....	3.36	3.78	² .42
Labor.....	11.00	4.50	6.50
Total.....	14.36	8.28	6.08

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill S averaged Middling minus in grade and $1\frac{1}{16}$ inch plus in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill S.

EXPLANATION OF DIFFERENCES IN COSTS, MILL S vs. MODEL MILL, 10s HOSEYRY YARN (TABLE 118)

OVERHEAD.—The overhead cost per pound for mill S is 0.42 cent below that of the Model mill, but without depreciation expenses it would be 0.47 cent a pound above that of the Model.

LABOR.—Some of the 6.50 cents a pound difference in labor costs for the two mills is accounted for by a 3.9 percent higher average hourly wage rate, and by a greater shop and yard expense in mill S than for the Model.

In the card room there is a difference of 1.75 cents per pound in the roving cost, even though both mills make a 1.00-hank roving, one-process, on 10- by 5-inch slubbers. Therefore, some of this difference is due to smaller job sizes, and lower machine productions.

The same thing is true in the spinning where there is a difference of 2.20 cents per pound, most of which is due to smaller job sizes, and lower spindle production.

Of the total difference in winding costs of 2.23 cents per pound, 1.49 cents are in the cost for direct winding labor, a small part of which is in wages, but most of which is due to lower spindle production. The spinning ring in Mill S is $2\frac{3}{8}$ inches, and in the Model it is $2\frac{1}{2}$ inches. The rest of this total difference in labor cost is mostly due to smaller job sizes for other employees around the winders.

In packing and shipping the difference of 0.32 cent per pound is mostly due to lower pounds per packer hand.

On the basis of the same average hourly wage rate in the two mills, the 6.50 cents per pound difference in labor cost would be reduced by 0.41 cent.

TABLE 119.—*Mill S and Model mill: Overhead cost per pound and differences for 10s hosiery yarn, and cost per spindle per week of 80 hours for Mill S, United States, May 1950*¹

Item	Cost per pound			Cost per spindle per week, Mill S
	Mill S	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	1. 04	0. 85	0. 19	6. 84
Power.....	. 66	. 64	. 02	4. 32
Insurance:				
Liability.....	. 09	. 03	. 06	. 57
Other.....	. 10	. 11	2. 01	. 68
Taxes, property.....	. 22	. 15	. 07	1. 44
Depreciation.....	. 36	1. 25	2. 89	2. 38
Fuel.....	. 09	. 05	. 04	. 60
Other expenses.....	. 13	. 17	2. 04	. 87
Salaries, etc.....	. 67	. 53	. 14	4. 36
Total.....	3. 36	3. 78	2. 42	22. 06

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Costs for Model mill larger than cost for Mill S.

TABLE 120.—*Mill S: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	57. 54	8-inch by 4-inch speed-ers.....	111. 42
Opening and picking.....	123. 31	Spinning.....	1, 003. 93
Carding.....	283. 65	Winding.....	766. 06
Drawing.....	222. 69	Packing and shipping.....	111. 65
10-inch by 5-inch slubbers.....	121. 17	Total.....	2, 801. 42

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 121.—*Mill S: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseer.....	40	1. 55	62. 00
Picker tenders.....	80	. 98	78. 40
Card grinder.....	40	1. 15	46. 00
Card hands.....	40	1. 10	44. 00
Oiler.....	80	1. 08	86. 40
Sweeper and oiler.....	40	1. 10	44. 00
Drawing hands.....	40	1. 10	44. 00
Slubber hands.....	160	1. 12	179. 20
Speeder hands.....	80	1. 08	86. 40
Sweeper.....	80	. 98	78. 40
Sweeper.....	40	. 94	37. 60
Spinning:			
Overseer.....	40	1. 55	62. 00
Doffers.....	240	1. 04	249. 60
Spinners.....	160	1. 09875	175. 80
Spinners.....	240	. 9975	239. 40
Roving hand.....	40	. 94	37. 60
Roving hand.....	40	. 99	39. 60
Filling hand.....	40	. 94	37. 60
Filling hand.....	40	. 99	39. 60
Fixer.....	40	1. 04	41. 60
Second hand.....	40	1. 15	46. 00
Spare hands.....	80	1. 04	83. 20
Winding and packing:			
Shipper.....	27	1. 04	28. 08
Packers.....	54	. 98	52. 92
Packer.....	27	. 94	25. 38
Bobbin hands and sweepers.....	80	. 94	75. 20
Winder tenders.....	480	1. 195	573. 60
Outside:			
Yard hand.....	27	1. 08	29. 16
Yard hand.....	27	. 94	25. 38
Clerk.....	40	1. 13	45. 20
Scrubber.....	27	. 94	25. 38
Watchmen.....	88	. 94	82. 72
Total or average.....	2, 597	1. 08	2, 801. 42

TABLE 122.—*Mill S and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		10s warp yarn	
		Mill S	Model mill	Mill S	Model mill
Cotton used:					
Grade ¹	-----	M—	M	M—	M
Staple length ²	Inch.....	$1\frac{5}{16}+$	1	$1\frac{5}{16}+$	1
Picker lap.....	Ounce.....	14	14	14	14
Quantity per picker week (40 hours).....	Pound.....	12, 305	11, 850	12, 305	11, 425
Card sliver.....	Grain.....	56	55	56	55
Quantity per card week (40 hours).....	Pound.....	405	368	405	368
Finished drawing sliver.....	Grain.....	52	55	52	55
Quantity per finished delivery week (40 hours).....	Pound.....	733	595	733	595
Slubber (first process):					
Hank roving.....	-----	1. 00	1. 00	1. 00	1. 00
Spinning:					
Revolutions per minute, front roll.....	-----	190	187	166	179
Twist multiplier.....	-----	3. 35	3. 50	4. 75	4. 50
Quantity per spindle (40 hours).....	Pound.....	3. 86	4. 25	3. 40	4. 10

¹ Minus (—) indicates slightly lower grade.² Plus (+) indicates slightly longer staple.

MILL T

Mill T is a small plant with less than 7,000 spindles, compared with about 10,000 spindles for the Model mill. The standard weekly pay roll of \$3,745 is about 25 percent less than the average for the 15 surveyed mills and somewhat larger than the average indicated for the Models. It spins a "medium" (4 to 12) number of yarn counts and data for 10s and 20s hosiery yarns are given as a basis for comparison.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill T, amounting to 54.98 cents for 10s yarns and 59.22 cents for 20s yarns, are almost 10 percent higher for 10s and almost 6 percent higher for 20s hosiery yarns than those indicated for Model mills (table 123). The cotton used averaged slightly higher in grade and considerably shorter in staple, and net cotton costs averaged 2.54 cents per pound, or about 7 percent, lower than indicated for the Models. Total manufacturing costs, amounting to 17.78 cents per pound for 10s yarns and 22.04 cents for 20s yarns, are almost 69 percent and 37 percent, respectively, higher than for Model Mills. Most of these differences are accounted for by differences in labor costs. Overhead costs average about the same to somewhat lower, and other manufacturing costs are somewhat higher, than for Models. Wage rates averaged more than 4 percent higher, production of yarn per hour of man labor averaged more than 50 percent lower, and labor cost per pound of yarn averaged more than 100 percent greater, than indicated for Model mills.

Detailed data on costs and related data with explanations of the differences in costs shown, follow.

TABLE 123.—*Mill T: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	10s hosiery yarn		20s hosiery yarn	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ²	54. 96	100. 0	59. 22	100. 0
Net cotton cost ³	37. 18	67. 6	37. 18	62. 8
Manufacturing cost.....	17. 78	32. 4	22. 04	37. 2
Labor ⁴	11. 37	20. 7	14. 01	23. 7
Overhead.....	3. 78	6. 9	5. 30	8. 9
Other.....	2. 63	4. 8	2. 73	4. 6
Taxes ⁵.....	. 24	. 4	. 29	. 5
Vacation pay ⁶.....	. 23	. 4	. 28	. 5
Packing materials.....	1. 12	2. 1	1. 12	1. 9
Freight.....	1. 04	1. 9	1. 04	1. 7

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged slightly higher in grade than Middling and $1\frac{1}{8}$ inch in length of staple. The price, 34.17 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. The price was adjusted for waste by multiplying it by 1.088, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.1 percent of labor cost.

⁶ Amounts to 2 percent of labor cost.

TABLE 124.—*Mill T and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950.*¹

Item of cost	Cost per pound		
	Mill T	Model mill	Difference
Roving:			
Handling and Storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 04	0. 06	² 0. 02
Labor.....	. 21	. 17	. 04
Total.....	. 25	. 23	. 02
Opening and picking:			
Overhead.....	. 38	. 37	. 01
Labor.....	. 34	. 24	. 10
Total.....	. 72	. 61	. 11

See footnotes at end of table.

TABLE 124.—*Mill T and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill T	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 84	1. 17	² 0. 33
Labor.....	1. 07	. 62	. 45
Total.....	1. 91	1. 79	. 12
Drawing:			
Overhead.....	. 28	. 29	² . 01
Labor.....	. 78	. 37	. 41
Total.....	1. 06	. 66	. 40
Fly frames:			
Overhead.....	. 62	. 26	. 36
Labor.....	2. 29	. 43	1. 86
Total.....	2. 91	. 69	2. 22
Total roving cost:			
Overhead.....	2. 16	2. 15	. 01
Labor.....	4. 69	1. 83	2. 86
Total.....	6. 85	3. 98	2. 87
Spinning:			
Overhead.....	1. 10	1. 29	² . 19
Labor.....	3. 77	1. 40	2. 37
Total.....	4. 87	2. 69	2. 18
Winding:			
Overhead.....	. 47	. 28	. 19
Labor.....	2. 63	1. 10	1. 53
Total.....	3. 10	1. 38	1. 72
Packing and shipping:			
Overhead.....	. 05	. 06	² . 01
Labor.....	. 28	. 17	. 11
Total.....	. 33	. 23	. 10
Total cost:			
Overhead.....	3. 78	3. 78	0
Labor.....	11. 37	4. 50	6. 87
Total.....	15. 15	8. 28	6. 87

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill T averaged Middling plus in grade and $1\frac{1}{16}$ inch in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill T.

EXPLANATION OF DIFFERENCES IN COSTS, MILL T vs. MODEL MILL, 10S
HOSIERY YARN (TABLE 124)

OVERHEAD.—In Mill T the cost per pound for depreciation is 0.58 cent below that for the Model mill, but the cost per pound for other items of overhead (net) is 0.58 cent above the similar figure for the Model mill. Most of the latter difference is in salaries.

LABOR.—The average hourly wage rate in Mill T is 4.5 percent above and the expense for shop and yard is higher than the Model. Both of these items contribute to higher labor costs.

In the preparatory departments through drawing, smaller job sizes and lower machine productions are responsible for most of the difference in labor costs of 1.00 cent per pound. On the fly frames, Mill T makes a two-process, 2.00 hank-roving, on 8- by 3½-inch frames, whereas the Model mill makes one-process, 1.00-hank roving, on 10- by 5-inch frames. This fact accounts for much of the difference in labor costs of 1.86 cents per pound of the fly frames, but smaller job sizes for other employees around the frames are also responsible for some of this difference.

The difference in labor costs for spinning in the two mills is 2.37 cents a pound. Spindle production per hour is better than in the Model mill, so aside from the effect of wages, and shop and outside expense, this difference is due to smaller job sizes, such as the spinners handling fewer sides, the doffers lifting fewer bobbins, and smaller job-sizes for other employees around the frames.

The yarn is spun on a large ring in Mill T, so smaller job sizes and lower productions per machine hour are responsible for most of the difference in winding labor costs of 1.53 cents per pound.

The present total difference in labor costs for this yarn in the two mills is 6.87 cents per pound, but it would be 0.50 cent lower if the mills had the same average hourly wage rate.

TABLE 125.—*Mill T and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill T	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.04	Cents 0.09	Cents ² 0.05
Labor.....	.21	.21	0
Total.....	.25	.30	² .05
Opening and picking:			
Overhead.....	.38	.51	² .13
Labor.....	.34	.36	² .02
Total.....	.72	.87	² .15

See footnotes at end of table.

TABLE 125.—*Mill T and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill T	Model mill	Difference
Roving—Continued			
Carding:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 84	1. 25	² 0. 41
Labor.....	1. 07	. 76	. 31
Total.....	1. 91	2. 01	² . 10
Drawing:			
Overhead.....	. 28	. 32	² . 04
Labor.....	. 78	. 33	. 45
Total.....	1. 06	. 65	. 41
Fly frames:			
Overhead.....	. 70	. 59	. 11
Labor.....	2. 56	. 74	1. 82
Total.....	3. 26	1. 33	1. 93
Total roving cost:			
Overhead.....	2. 24	2. 76	² . 52
Labor.....	4. 96	2. 40	2. 56
Total.....	7. 20	5. 16	2. 04
Spinning:			
Overhead.....	2. 54	3. 22	² . 68
Labor.....	6. 14	2. 88	3. 26
Total.....	8. 68	6. 10	2. 58
Winding:			
Overhead.....	. 47	. 53	² . 06
Labor.....	2. 63	1. 57	1. 06
Total.....	3. 10	2. 10	1. 00
Packing and shipping:			
Overhead.....	. 05	. 13	² . 08
Labor.....	. 28	. 20	. 08
Total.....	. 33	. 33	0
Total cost:			
Overhead.....	5. 30	6. 64	² 1. 34
Labor.....	14. 01	7. 05	6. 96
Total.....	19. 31	13. 69	5. 62

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill T averaged Middling plus in grade and $1\frac{1}{8}$ inch in length of staple, whereas Middling $1\frac{1}{2}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill T.

EXPLANATION OF DIFFERENCES IN COSTS, MILL T vs. MODEL MILL, 20s
HOSIERY YARN (TABLE 125)

OVERHEAD.—The total overhead cost per pound, without depreciation, amounts to 4.36 cents in Mill T and 4.53 cents in the Model mill—a favorable comparison. Because of new buildings, new machinery, etc. in the Model, the depreciation is 1.17 cents per pound more than for Mill T, which shows as a net result that this mill has a 1.34 cents per pound lower total overhead cost than the Model.

LABOR.—The carding and drawing costs per pound are 0.31 cent and 0.45 cent, respectively, higher than for the Model. The chief reason for these differences is that the employees on these machines are not handling as many pounds as those set up in the Model mill.

On the fly frames, cost per pound is 1.82 cents higher than for the Model. The principal reason is that Mill T has two processes of roving, compared with one process in the Model.

The spinning cost per pound is 3.26 cents higher than the Model mill, of which 0.87 cent is due to spinners, 0.73 cent is due to doffers, and 1.66 cents is for the indirect labor. The reasons for these differences are that spindles per spinner and the pounds handled per hour for the other employees in this department are lower than those set up in the Model.

Winding cost is 1.06 cents per pound higher than for the Model mill, largely because the winder tenders are not winding so many pounds per hour as those set up in the Model.

The total labor cost per pound is 6.96 cents per pound higher than that for the Model mill and the average hourly rate is about 4.62 percent higher. This difference in wage rate would amount to about 0.62 cent per pound of yarn.

TABLE 126.—*Mill T and Model mill: Overhead costs per pound and difference, by kinds of yarn, and cost per spindle per week of 80 hours for Mill T, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill T
	10s hosiery yarn			20s hosiery yarn			
	Mill T	Model mill	Difference	Mill T	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	0. 94	0. 85	0. 09	1. 32	1. 25	0. 07	5. 55
Power-----	. 64	. 64	0	. 90	1. 25	² . 35	3. 80
Insurance:							
Liability-----	. 08	. 03	. 05	. 11	. 05	. 06	. 46
Other-----	. 09	. 11	² . 02	. 13	. 18	² . 05	. 56
Taxes, property-----	. 11	. 15	² . 04	. 15	. 25	² . 10	. 63
Depreciation-----	. 67	1. 25	² . 58	. 94	2. 11	² 1. 17	3. 95
Fuel-----	. 10	. 05	. 05	. 14	. 09	. 05	. 60
Other expenses-----	. 19	. 17	. 02	. 27	. 35	² . 08	1. 12
Salaries, etc-----	. 96	. 53	. 43	1. 34	1. 11	. 23	5. 69
Total-----	3. 78	3. 78	0	5. 30	6. 64	² 1. 34	22. 36

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Cost for Model mill larger than cost for Mill T.TABLE 127.—*Mill T: Summary of standard weekly payroll (two shifts or 80-hours basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage	57. 54	Spinning	1, 569. 05
Opening and picking	96. 17	Winding	735. 89
Carding	299. 62	Packing and shipping	77. 40
Drawing	218. 03		
10- by 5-inch frames	240. 06	Total	3, 744. 78
8- by 3½-inch frames	451. 02		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 128.—*Mill T: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Overseers.....	80		128. 90
Card grinder.....	40	1. 15	46. 00
Fixers.....	40	1. 13	45. 20
Oilers and spare hands.....	80	1. 13	90. 40
Sweepers and roving hands.....	80	1. 13	90. 40
Picker tenders.....	80	. 96	76. 80
Drawing hands.....	53½	1. 00	53. 34
Card hands.....	80	1. 01	80. 80
Slubber hands.....	80	. 94	75. 20
Speeder hands.....	160	1. 00	160. 00
Spinning and winding:	80	1. 29	103. 20
Overseers.....	240	1. 08	259. 20
Second hand.....			
Oilers and fixers.....	80	1. 15	128. 90
Yarn wrappers.....	40	1. 13	46. 00
Sweepers.....	80	1. 10	88. 00
Doffers.....	80	. 94	75. 20
Spinners.....	320	1. 065	340. 80
Spare hands.....	640	1. 0125	648. 00
Roving haulers.....	80	1. 0125	81. 00
Cleaners.....	80	. 94	75. 20
Winder hands.....	80	1. 0125	81. 00
Shop and outside:	560	1. 1275	631. 40
Truck driver.....	27	1. 13	30. 51
Clerk.....	40		54. 40
Watchmen.....	88	. 94	82. 72
Yard hand.....	27	. 94	25. 38
Carpenter.....	27	1. 15	31. 05
Scrubber.....	27	. 94	25. 38
Total or average.....	3, 449	1. 09	3, 744. 78

TABLE 129.—*Mill T and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	10s hosiery yarn		20s hosiery yarn	
		Mill T	Model mill	Mill T	Model mill
Cotton used:					
Grade ¹		M+	M	M+	M
Staple length	Inch	$1\frac{1}{16}$	1	$1\frac{1}{16}$	$1\frac{1}{32}$
Picker lap	Ounce	14	14	14	14
Quantity per picker week (40 hours)	Pound	11, 238	11, 850	11, 238	9, 600
Card sliver	Grain	55	55	55	55
Quantity per card week (40 hours)	Pound	357	368	357	368
Finished drawing sliver	Grain	55	55	55	55
Quantity per finisher delivery week (40 hours)	Pound	549	595	549	575
Slubber (first process):					
Hank roving		. 95	1. 00	. 95	2. 00
Speeder (second process):					
Hank roving		2. 00		2. 40	
Spinning:					
Revolutions per minute, front roll		200	187	169	148
Twist multiplier		3. 50	3. 50	3. 50	3. 50
Quantity per spindle (40 hours)	Pound	4. 41	4. 25	1. 91	1. 70

¹ Plus (+) indicates slightly higher grade.

MILL U

Mill U is classified as "large" (14,000 to 25,000 spindles) compared with about 10,000 spindles for Model mills. The standard weekly pay roll of \$8,195 is more than 62 percent higher than the average for the 15 mills surveyed and more than three times as large as that indicated for the Model for 20s yarn. Mill U spins a "medium" (4 to 12) number of yarns, compared with one indicated for the Model mills and data for 20s and 30s hosiery yarn are given as a basis for comparison.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill U, amounting to 62.46 cents for 20s yarns and 66.13 cents for 30s yarns, are almost 12 percent greater for 20s and 8 percent greater for 30s hosiery yarns than those indicated for Model mills (table 130). The quality of the cotton used, and net cotton costs,

averaged about the same as indicated for the Models. Total manufacturing costs, amounting to 22.52 cents per pound for 20s yarns and 26.19 cents for 30s yarns, are 40 percent and 24 percent, respectively, higher than those for Model mills. Most of these differences are accounted for by differences in labor costs. Overhead costs average less and other manufacturing costs average more than for the Models. Wage rates averaged about 12 percent higher, production of yarn per man-hour averaged about 35 percent less, and labor cost per pound of yarn averaged 84 percent higher for 20s yarn and 58 percent higher for 30s yarn than for the Models.

Detailed data on costs and related data with explanations of differences in costs, follow.

TABLE 130.—*Mill U: Average cost per pound for specified kinds of carded cotton yarn, United States, May 1950*¹

Item	20s hosiery yarn		30s hosiery yarn	
	<i>Cents</i>	<i>Percent</i>	<i>Cents</i>	<i>Percent</i>
Total cost of yarn ²	62. 46	100. 0	66. 13	100. 0
Net cotton cost ³	39. 94	63. 9	39. 94	60. 4
Manufacturing cost	22. 52	36. 1	26. 19	39. 6
Labor ⁴	12. 97	20. 8	14. 94	22. 6
Overhead	6. 67	10. 7	8. 27	12. 5
Other	2. 88	4. 6	2. 98	4. 5
Taxes ⁵ .....	. 30	. 5	. 34	. 5
Vacation pay ⁶ .....	. 37	. 6	. 43	. 7
Packing materials	1. 13	1. 8	1. 13	1. 7
Freight	1. 08	1. 7	1. 08	1. 6

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Discounts and selling expenses not included.

³ The cotton averaged Middling in grade and 1½ inches plus in length of staple. The price, 35.79 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.116, the net waste multiplier, to give net cotton cost per pound of yarn.

⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.

⁵ Social security and old-age benefits which account for 2.3 percent of labor cost.

⁶ Amounts to 2.85 percent of labor cost.

TABLE 131.—*Mill U and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill U	Model mill	Difference
Roving:			
Handling and storage:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 06	0. 09	² 0. 03
Labor.....	. 22	. 21	. 01
Total.....	. 28	. 30	² . 02
Opening and picking:			
Overhead.....	. 27	. 51	² . 24
Labor.....	. 16	. 36	² . 20
Total.....	. 43	. 87	² . 44
Carding:			
Overhead.....	1. 20	1. 25	² . 05
Labor.....	1. 11	. 76	. 35
Total.....	2. 31	2. 01	. 30
Drawing:			
Overhead.....	. 27	. 32	² . 05
Labor.....	. 31	. 33	² . 02
Total.....	. 58	. 65	² . 07
Fly frames:			
Overhead.....	1. 45	. 59	. 86
Labor.....	3. 07	. 74	2. 33
Total.....	4. 52	1. 33	3. 19
Total roving cost:			
Overhead.....	3. 25	2. 76	. 49
Labor.....	4. 87	2. 40	2. 47
Total.....	8. 12	5. 16	2. 96
Spinning:			
Overhead.....	2. 55	3. 22	² . 67
Labor.....	4. 36	2. 88	1. 48
Total.....	6. 91	6. 10	. 81
Winding:			
Overhead.....	. 79	. 53	. 26
Labor.....	3. 43	1. 57	1. 86
Total.....	4. 22	2. 10	2. 12

See footnotes at end of table.

TABLE 131.—*Mill U and Model mill: Average overhead and labor costs per pound for 20s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill U	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 08	0. 13	² 0. 05
Labor.....	. 31	. 20	. 11
Total.....	. 39	. 33	. 06
Total cost:			
Overhead.....	6. 67	6. 64	. 03
Labor.....	12. 97	7. 05	5. 92
Total.....	19. 64	13. 69	5. 95

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill U averaged Middling in grade and $1\frac{1}{2}$ inches plus in length of staple, whereas Middling $1\frac{1}{2}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill U.

EXPLANATION OF DIFFERENCES IN COSTS, MILL U VS. MODEL MILL, 20s HOSEYRY YARN (TABLE 131)

OVERHEAD.—The total overhead cost per pound, without depreciation, amounts to 6.12 cents in Mill U, compared with 4.53 cents in the Model mill. The principal reason for this difference is that "other expense" is 1.78 cents per pound higher than for the Model mill. Because of new buildings, new machinery, etc. in the Model mill, the depreciation cost amounts to 1.56 cents per pound more than for Mill U, which shows as a net cost of only 0.03 cent per pound above the Model mill.

LABOR.—The cost through drawing compares favorably with the Model mill, but the fly-frame cost is 2.33 cents per pound higher. The principal reason for this difference is that Mill U has two processes of roving, compared with one process in the Model mill.

Spinning cost per pound is 1.48 cents higher than the Model, of which 0.49 cent is due to the spinners having smaller job sizes. The rest is mainly due to higher man-hours, for the pounds produced, for the other indirect employees, such as section men, roving haulers, sweepers, oilers and banders, compared with those set up in the Model.

The winding cost is 1.86 cents per pound higher than the Model mill, of which 1.31 cents is due to the winder tenders winding fewer pounds, principally because the spinning bobbins in Mill U are smaller than those used in the Model.

The total labor cost per pound in Mill U is higher by 5.92 cents and the average hourly rate in this mill is about 12.5 percent higher than for the Model. This difference in wage rates would amount to about 1.44 cents per pound of yarn.

TABLE 132.—*Mill U and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill U	Model mill	Difference
Roving:			
Handling and storage:			
Overhead.....	Cents 0.06	Cents 0.08	Cents 0.02
Labor.....	.22	.18	.04
Total.....	.28	.26	.02
Opening and picking:			
Overhead.....	.27	.60	2.33
Labor.....	.16	.33	2.17
Total.....	.43	.93	2.50
Carding:			
Overhead.....	1.20	1.30	2.10
Labor.....	1.11	.89	.22
Total.....	2.31	2.19	.12
Drawing:			
Overhead.....	.27	.40	2.13
Labor.....	.31	.46	2.15
Total.....	.58	.86	2.28
Fly frames:			
Overhead.....	1.45	.89	.56
Labor.....	3.07	1.06	2.01
Total.....	4.52	1.95	2.57
Total roving cost:			
Overhead.....	3.25	3.27	2.02
Labor.....	4.87	2.92	1.95
Total.....	8.12	6.19	1.93
Spinning:			
Overhead.....	4.06	4.84	2.78
Labor.....	5.93	4.22	1.71
Total.....	9.99	9.06	.93
Winding:			
Overhead.....	.88	.88	0
Labor.....	3.83	2.09	1.74
Total.....	4.71	2.97	1.74

See footnotes at end of table.

TABLE 132.—*Mill U and Model mill: Average overhead and labor costs per pound for 30s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill U	Model mill	Difference
Packing and shipping:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 08	0. 15	² 0. 07
Labor.....	. 31	. 21	. 10
Total.....	. 39	. 36	. 03
Total cost:			
Overhead.....	8. 27	9. 14	2. 87
Labor.....	14. 94	9. 44	5. 50
Total.....	23. 21	18. 58	4. 63

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill U averaged middling in grade and $1\frac{1}{32}$ inches plus in length of staple, whereas Middling $1\frac{1}{16}$ -inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill U.

EXPLANATION OF DIFFERENCES IN COSTS, MILL U VS. MODEL MILL, 30S HOSEYRY YARN (TABLE 132)

OVERHEAD.—Without the charge for depreciation, the overhead cost per pound for Mill U is 7.58 cents. In the Model mill, the comparable figure is 6.38 cents. Mill U is below the Model in expenses for power, insurance, taxes, fuel, and salaries by a total of 1.22 cents, but in supplies and repairs they are higher by 0.34 cent per pound, and in other expense they are higher by 2.08 cents.

LABOR.—The labor cost per pound, for the processes through drawing, is about the same for the two mills, so the big difference in the roving cost per pound is around the fly frames. Mill U uses a two-process 5.00-hank roving, while the model is set up to use a single process 3.00-hank roving. A relatively larger shop and outside pay roll in Mill U, some of which is allocated to each department, is also reflected in this difference. Principally, these conditions contribute to the 1.95 cents per pound excess roving cost of Mill U over that for the Model mill.

The difference in spinning labor costs is 1.71 cents per pound. Some of this difference is due to spinners not tending so many sides, some to doffers not lifting so many bobbins, some to section men, oilers, banders, etc., not having the same work-loads, and some to the effect of the larger shop and outside pay roll, compared with the Model mill.

Winder tenders in Mill U tend 50 spindles, and in the Model they tend 68 spindles, and the difference in direct labor costs per pound

accounts for 1.19 cents of total difference of 1.74 cents in winding labor costs. The rest is due to smaller job loads for section men, inspectors, and yarn men, and to the effect of the larger shop and outside pay roll.

TABLE 133.—*Mill U and Model mill: Overhead cost per pound and differences, by kinds of yarn, and cost per spindle per week of 80 hours for Mill U, United States, May 1950*¹

Item	Cost per pound for—						Cost per spindle per week, Mill U
	20s hosiery yarn			30s hosiery yarn			
	Mill U	Model mill	Differ- ence	Mill U	Model mill	Differ- ence	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs	1. 60	1. 25	0. 35	1. 99	1. 65	0. 34	4. 55
Power	. 93	1. 25	² . 32	1. 16	1. 62	² . 46	2. 65
Insurance:							
Liability	. 05	. 05	0	. 06	. 07	² . 01	. 13
Other	. 05	. 18	² . 13	. 06	. 25	² . 19	. 13
Taxes, property	. 10	. 25	² . 15	. 12	. 33	² . 21	. 27
Depreciation	. 55	2. 11	² 1. 56	. 69	2. 76	² 2. 07	1. 57
Fuel	. 04	. 09	² . 05	. 05	. 12	² . 07	. 12
Other expenses	2. 13	. 35	1. 78	2. 64	. 56	2. 08	6. 05
Salaries, etc	1. 22	1. 11	. 11	1. 50	1. 78	² . 28	3. 45
Total	6. 67	6. 64	. 03	8. 27	9. 14	² . 87	18. 92

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill U.

TABLE 134.—*Model U: Summary of standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage	122. 12	Spinning	3, 122. 21
Opening and picking	153. 71	Winding	2, 082. 32
Carding	621. 32	Packing and shipping	168. 12
Drawing	162. 68	Total	8, 195. 14
Slubbers	662. 78		
Speeders	1, 099. 88		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 135.—*Mill U: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total payroll per week
Carding:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Second hands.....	80	1. 5575	124. 60
Frame section men.....	80	1. 3050	104. 40
Card tenders.....	200	1. 0325	206. 50
Card grinders.....	100	1. 3050	130. 50
Card strippers.....	100	1. 0325	103. 25
Drawing tenders.....	80	1. 2717	101. 74
Roving tenders.....	80	. 9825	78. 60
Slubber tenders.....	320	1. 3021	416. 67
Speeder tenders.....	640	1. 3076	836. 86
Sweepers.....	80	. 9500	76. 00
Oiler.....	30	1. 0325	30. 98
Spinning:			
Overseer.....	80		228. 25
Second hands.....	80	1. 5575	124. 60
Spinners.....	1280	1. 0775	1, 379. 20
Doffers.....	400	1. 1200	448. 00
Section men.....	160	1. 3050	208. 80
Roll picker.....	27	. 9825	26. 53
Roving haulers.....	134	. 9825	131. 66
Traveler changer.....	27	1. 0775	29. 09
Roll scrubbers.....	80	. 9825	78. 60
Sweepers.....	80	. 9500	76. 00
Oilers and banders.....	106	1. 0325	109. 45
Cleaners.....	27	. 9825	26. 53
Overhaulers.....	106	1. 3050	138. 33
Week-end cleaning.....	27	. 9825	26. 53
Winding:			
Yarn inspectors.....	80	1. 0125	81. 00
Section men.....	80	1. 3050	104. 40
Winder hands.....	1440	1. 1076	1, 594. 94
Yarn men.....	80	. 9825	78. 60
Cone and tube cleaner.....	27	. 9825	26. 53
Overhauler.....	27	1. 3050	35. 24
Packing:			
Weigher.....	27	. 9825	26. 53
Inspector.....	27	. 9825	26. 53
Packer.....	27	. 9825	26. 53
Shipping clerk.....	40	1. 3050	52. 20
Box man.....	27	. 9825	26. 53
Opening and picking labor.....			104. 90
Shop and outside labor.....			769. 54
Total or average.....	6, 286	1. 16	8, 195. 14

TABLE 136.—*Mill U and Model mill: Operating data and draft program, by kind of carded cotton yarn, United States, May 1950*

Item	Unit	20s hosiery yarn		30s hosiery yarn	
		Mill U	Model mill	Mill U	Model mill
Cotton used:					
Grade-----		M	M	M	M
Staple length ¹ -----	Inch-----	1 $\frac{1}{32}$ +	1 $\frac{1}{32}$	1 $\frac{1}{32}$ +	1 $\frac{1}{16}$
Picker lap-----	Ounce-----	14	14	14	14
Quantity per picker week (40 hours)-----	Pound-----	12, 840	9, 600	12, 800	11, 850
Card sliver-----	Grain-----	50	55	50	55
Quantity per card week (40 hours)-----	Pound-----	242	368	242	368
Finished drawing sliver-----	Grain-----	48	55	48	55
Quantity per finisher delivery week (40 hours)-----	Pound-----	492	575	492	570
Slubber (first process):					
Hank roving-----		1. 60	2. 00	1. 60	3. 00
Speeder (second process):					
Hank roving-----		5. 00	-----	5. 00	-----
Spinning:					
Revolutions per minute, front roll-----		156	148	144	136
Twist multiplier-----		3. 38	3. 50	3. 41	3. 50
Quantity per spindle (40 hours)-----	Pound-----	1. 72	1. 70	1. 08	1. 06

¹ Plus (+) indicates slightly longer staple.

MILL V

Mill V is classified as "medium" (7,000 to 14,000 spindles) in size, compared with about 10,000 spindles for Model mills. The standard weekly payroll of \$6,113 is 21 percent larger than the average for the 15 mills surveyed and 51 percent larger than that indicated for the Model for 10s yarn. Mill V spins a "medium" (4 to 12) number of yarn counts, compared with one indicated for the Model mill, and data for 10s hosiery yarn are given as a basis for comparison.

Total costs per pound of yarn, exclusive of discounts and selling expenses, for Mill V, amounting to 52.96 cents for 10s yarn, are 5.8 percent higher than for the Model mill. The cotton used averaged higher in grade and shorter in staple, and net cotton costs of 38.75 cents per pound are 0.77 cent, or about 2 percent less (table 137). Total manufacturing costs amounting to 14.21 cents per pound, are 3.67 cents, or 35 percent, higher than for the Model mill; mostly because of the differences in labor costs, but partly because overhead and other manufacturing costs are larger. Wage rates averaged almost 12 percent higher, production of yarn per man-hour averaged about 34 percent less, and labor cost per pound of yarn averaged 68 percent greater, than those indicated for the Model.

Detailed data on costs and related data and explanations of differences in costs, follow.

TABLE 137.—*Mill V: Average cost per pound for 10s hosiery carded cotton yarn, United States, May 1950*¹

Item	Costs per pound	
	Cents	Percent
Total cost of yarn ² -----	52. 96	100. 0
Net cotton cost ³ -----	38. 75	73. 2
Manufacturing cost-----	14. 21	26. 8
Labor ⁴ -----	7. 59	14. 3
Overhead-----	3. 83	7. 2
Other-----	2. 79	5. 3
Taxes ⁵ -----	. 17	. 3
Vacation pay ⁶ -----	. 22	. 4
Packing materials-----	1. 32	2. 5
Freight-----	1. 08	2. 1

¹ All costs are adjusted to 2 shifts or 80 hours per week.² Discounts and selling expenses not included.³ The cotton averaged Strict Middling in grade and $3\frac{1}{2}$ inch in length of staple. The price, 35.29 cents per pound, was based on official quotations for cotton, "landed group B mill points," Mar. 30, 1950. This price was adjusted for waste by multiplying it by 1.098, the net waste multiplier, to give net cotton cost per pound of yarn.⁴ Includes all labor on payroll except superintendence, which is included in overhead cost.⁵ Social-security and old-age benefits which account for 2.3 percent of labor cost.⁶ Amounts to 2.86 percent of labor cost.TABLE 138.—*Mill V and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹

Item of cost	Cost per pound		
	Mill V	Model mill	Difference
Roving:			
Handling and storage:			
Overhead-----	Cents 0. 05	Cents 0. 06	Cents ² 0. 01
Labor-----	. 20	. 17	. 03
Total-----	. 25	. 23	. 02
Opening and picking:			
Overhead-----	. 34	. 37	² . 03
Labor-----	. 41	. 24	. 17
Total-----	. 75	. 61	. 14
Carding:			
Overhead-----	. 79	1. 17	² . 38
Labor-----	. 87	. 62	. 25
Total-----	1. 66	1. 79	² . 13

See footnotes at end of table.

TABLE 138.—*Mill V and Model mill: Average overhead and labor costs per pound for 10s hosiery cotton yarn and differences, United States, May 1950*¹—Continued

Item of cost	Cost per pound		
	Mill V	Model mill	Difference
Roving—Continued			
Drawing:	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Overhead.....	0. 22	0. 29	² 0. 07
Labor.....	. 36	. 37	² . 01
Total.....	. 58	. 66	² . 08
Fly frames:			
Overhead.....	. 62	. 26	. 36
Labor.....	1. 06	. 43	. 63
Total.....	1. 68	. 69	. 99
Total roving cost:			
Overhead.....	2. 02	2. 15	² . 13
Labor.....	2. 90	1. 83	1. 07
Total.....	4. 92	3. 98	. 94
Spinning:			
Overhead.....	1. 48	1. 29	. 19
Labor.....	2. 45	1. 40	1. 05
Total.....	3. 93	2. 69	1. 24
Winding:			
Overhead.....	. 28	. 28	0
Labor.....	2. 02	1. 10	. 92
Total.....	2. 30	1. 38	. 92
Packing and shipping:			
Overhead.....	. 05	. 06	² . 01
Labor.....	. 22	. 17	. 05
Total.....	. 27	. 23	. 04
Total cost:			
Overhead.....	3. 83	3. 78	. 05
Labor.....	7. 59	4. 50	3. 09
Total.....	11. 42	8. 28	3. 14

¹ All costs are adjusted to 2 shifts or 80 hours per week. Cotton used by Mill V averaged Strict Middling in grade and $\frac{3}{8}$ inch in length of staple, whereas Middling 1-inch cotton was specified for Model mill.

² Cost for Model mill larger than cost for Mill V.

EXPLANATION OF DIFFERENCES IN COSTS, MILL V vs. MODEL MILL, 10s HOSEYRY YARN (TABLE 138)

OVERHEAD.—The total overhead cost per pound of yarn in Mill V and Model mill is about the same, but in depreciation expense Mill

V is 0.99 cent per pound lower than the Model; to counterbalance this situation it is 0.99 cent per pound higher than the Model in other expense.

LABOR.—Difference in average hourly wage rate between these two mills amounts to 10.8 percent, so this item is partly responsible for the excess labor costs in this mill.

In the card room, smaller job sizes and lower machine productions on the cards and drawing frames are responsible for part of the labor cost difference through drawing of 0.44 cent per pound. The fact that Mill V uses 2.00-hank roving, where the Model mill uses 1.00-hank roving, is principally responsible for the difference of 0.63 cent per pound on the fly frames.

The difference in spinning labor costs per pound of yarn is 1.05 cents, part of which is due to lower spindle production, and part to smaller job sizes for all employees in this department.

The ring size in Mill V is $2\frac{1}{2}$ inch as compared to $2\frac{1}{2}$ inch in the Model mill, which affects the relation of direct winding labor costs in the two mills. Part of the difference in total-winding labor cost of 0.92 cent per pound is due to smaller job-sizes for other employees around the winders.

The 3.09 cents per pound difference in total labor costs for this yarn would be 0.74 cent lower if the two mills had the same average hourly wage rate.

The total difference in labor costs in the two mills is 5.50 cents per pound of yarn. The average wage rate per hour in Mill V is 10.77 percent above that of the Model mill. On the basis of the same average hourly rate, the above difference would be reduced 1.45 cents per pound of yarn.

TABLE 139.—*Mill V and Model mill: Overhead costs per pound and differences for 10s hosiery yarn, and costs per spindle per week of 80 hours for Mill V, United States, May 1950*.¹

Item	Cost per pound			Cost per spindle per week, Mill V
	Mill V	Model mill	Difference	
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
Supplies and repairs.....	1. 06	0. 85	0. 21	8. 43
Power.....	. 64	. 64	0	5. 10
Insurance:				
Liability.....	. 02	. 03	² . 01	. 17
Other.....	. 02	. 11	² . 09	. 17
Taxes, property.....	. 09	. 15	² . 06	. 74
Depreciation.....	. 26	1. 25	² . 99	2. 06
Fuel.....	. 07	. 05	. 02	. 59
Other expenses.....	1. 16	. 17	. 99	9. 19
Salaries, etc.....	. 51	. 53	² . 02	4. 08
Total.....	3. 83	3. 78	. 05	30. 53

¹ All costs are adjusted to 2 shifts or 80 hours per week.

² Cost for Model mill larger than cost for Mill V.

TABLE 140.—*Mill V: Summary of standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn, by departments, United States, May 1950*¹

Department	Amount per week	Department	Amount per week
	<i>Dollars</i>		<i>Dollars</i>
Handling and storage.....	169. 12	Spinning.....	1, 900. 67
Opening and picking.....	374. 19	Winding.....	1, 722. 70
Carding.....	823. 87	Packing and shipping.....	189. 33
Drawing.....	316. 48		
12 by 6-inch frames.....	116. 44	Total.....	6, 113. 07
9 by 4½-inch and 10 by 5-inch frames.....	500. 27		

¹ Labor costs not applicable to single yarns were omitted in figuring detailed costs.

TABLE 141.—*Mill V: Standard weekly payroll (two shifts or 80-hour basis) for the manufacture of carded cotton yarn by occupation, United States, May 1950*

Occupation	Total hours per week	Wage rate per hour	Total pay roll per week
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Carding:			
Overseers.....	80		187. 00
Opener men.....	110	1. 1528	126. 81
Picker tenders.....	110	1. 2105	133. 16
Card grinders.....	220	1. 5345	337. 59
Card tenders.....	110	1. 0325	113. 58
Card strippers.....	220	1. 0325	227. 15
Sweepers.....	110	. 9500	104. 50
Section men.....	80	1. 3050	104. 40
Drawing tenders.....	220	1. 1550	254. 10
Slubber tenders.....	80	1. 0762	86. 10
Intermediate tenders.....	240	1. 2545	301. 08
Overhaulers.....	60	1. 3050	78. 30
Spinning:			
Section men.....	80	1. 3050	104. 40
Roving haulers.....	80	. 9825	78. 60
Oilers and banders.....	80	1. 0325	82. 60
Spinners.....	800	1. 0775	862. 00
Doffers.....	320	1. 1200	358. 40
Sweepers.....	80	. 9500	76. 00
Overhaulers.....	120	1. 3050	156. 00
Winding:			
Section men.....	80	1. 3050	104. 40
Winder hands.....	1, 120	1. 1013	1, 233. 46
Rewinder hand.....	32	. 9825	31. 44
Yarn men.....	160	. 9825	157. 20
Yarn inspectors.....	80	1. 0125	81. 00
Overhauler.....	32	1. 3050	41. 76

TABLE 141.—*Mill V: Standard weekly payroll (2 shifts or 80-hour basis) for the manufacture of carded cotton yarn by occupation, United States, May 1950—Continued*

Occupation	Total hours per week	Wage rate per hour	Total pay roll per week
Packing:	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Weigher.....	32	0. 9825	31. 44
Yarn wrapper.....	32	. 9825	31. 44
Box maker.....	32	. 9825	31. 44
Packer.....	32	1. 1860	37. 95
Shipping clerk.....	32	1. 3600	43. 52
Shop and outside:			
Master mechanic.....	40		94. 95
Machinist.....	40	1. 3050	52. 20
Watchman (third shift).....	40	1. 0625	42. 50
Watchman, special.....	40	1. 0125	40. 50
Janitor.....	40	. 9500	38. 00
Supply clerk.....	40	1. 1125	44. 50
Waste house man.....	40	. 9500	38. 00
Mill carpenter.....	40	1. 0100	40. 40
Yard laborers.....	80	. 9500	76. 00
Week-end watchman.....	48	1. 0125	48. 60
Total or average.....	5, 312	1. 15	6, 113. 07

TABLE 142.—*Mill V and Model mill: Operating data and draft program, for 10s hosiery carded cotton yarn, United States, May 1950*

Item	Unit	Mill V	Model mill
Cotton used:			
Grade.....		SM	M
Staple length.....	Inch.....	$3\frac{1}{2}$	1
Picker lap.....	Ounce.....	14	14
Quantity per picker week (40 hours).....	Pound.....	11, 770	11, 850
Card sliver.....	Grain.....	57	55
Quantity per card week (40 hours).....	Pound.....	460	368
Finished drawing sliver.....	Grain.....	57	55
Quantity per finisher delivery week (40 hours).....	Pound.....	679	595
Slubber (first process): Hank roving.....		2. 00	1. 00
Spinning:			
Revolutions per minute, front roll.....		181	187
Twist multiplier.....		3. 40	3. 50
Quantity per spindle (40 hours).....	Pound.....	3. 81	4. 25